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ABSTRACT

This final report describes a study to investigate the effects of an intervention procedure that included time delay, praise, and other cues on the acquisition of safety skills in preschool children with disabilities. Twelve preschool-aged children with disabilities from six different classrooms participated. Preventive safety skills consisted of recognizing exemplars of an unsafe situation and changing it in order to make it safer. Responding to unsafe settings was measured in two settings: classroom and home. One pair of children was instructed using a multi-component teaching procedure that incorporated time delay, prompts, and praise. The other child watched. A multiple probe design across pairs of children was used to assess the effects of the procedures. Learners who were directly taught correctly completed more preventive steps during teaching than baseline sessions and showed some generalization of responding to unsafe situations. Learners who observed did not respond to classroom probes, however, when an extra cue was provided, three of these learners correctly responded. No learner consistently responded to unsafe situations set up during home probes before or after the teaching. Results of the study are discussed in terms of: (1) target and observational learners' responses to unsafe situations as a result of teaching; (2) generalization of skills to the home setting; (3) evidence of maintenance; (4) reliable implementation of teaching procedure; and (5) parents' and teachers' responses to the research. (Contains 51 references and 10 appendices.) (SG)

**Using Constant Time Delay to Teach
Preventative Safety Skills to Preschoolers with Disabilities**

Final Report

Grant # H023B70068

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Awarded to:

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Overview of this report

The purpose of this project was to investigate the effects of an intervention procedure that included time delay, praise, and other cues on the acquisition of safety skills on the part of preschool children with disabilities. The investigation examined the effects of the procedure on children who received instruction and upon those who observed a child who received instruction. The study was expected to contribute to the participating children's acquisition of skills to prevent accidents and to contribute to the literature on teaching safety skills to children with disabilities in natural environments.

The Project objectives and major activities to complete them are listed below. As the Project supported a research study, following the brief report on the accomplishment of objectives, a comprehensive description of the study, its outcomes, and implications is attached. Entitled "Teaching Preventative Safety Skills to Preschool Children with Disabilities: Direct and Observational Learning Effects," this investigation is presented in chapters that describe the literature regarding safety skills, the intervention, its results and implications for future research.

Objective 1. Examine the effects of observing and participating in an intervention that included constant time delay, praise, and other cues on the acquisition, generalization, and maintenance of preventative safety skills in preschoolers with disabilities. The activities to complete the objective, all of which were completed within the Project period were:

1. Conduct focus group to identify specific skills. (See pages 20-22 of study).
2. Define the dependent measures. (See study, pages 20-23).
3. Develop measures and protocols. (See pages 32-33 and Appendices C-G).
4. Secure Project staff. (See pages 32-33).
5. Conduct study. (See Chapter 3, pp. 37- 60).

6. Analyze data. (See Chapter 3).

Objective 2. Disseminate information from Project through research reports, published articles, conference presentations, and parent news publications. The activities to complete this objectives and the status of their completion are:

1. Write manuscripts and submit for publication to (a) a peer-reviewed journal and (b) parent news publication. To be completed by September, 1999.
2. Complete final research report for funding agency. Completed, per attached report.
3. Present study at professional conference. Completed July, 1998. The study was presented at two conferences, The Association for Behavior Analysis in Orlando, Florida in May 1998 (Tso, M. & Rule, S. Using Constant Time Delay to Teach Safety Skills to Preschoolers with Disabilities) and at the Office of Special Education's Research in Education of Individuals with Disabilities Project Directors' meeting in Washington, D.C. in July, 1998 (Tso, M. & Rule, S., Teaching Safety Skills to Preschoolers with Disabilities).
4. Present information on using procedures at home to interested parents. Completed in March, 1998. Marion Tso conducted a workshop at Utah's Statewide Preschool and Early Intervention Conference entitled Teaching preschoolers preventative safety skills.

Evaluation of the Project (see page 21 of the approved application)

The Project Evaluation Plan addressed the objectives and activities listed above. As described, all were completed during the Project periods except for the submission of a manuscript to a peer-reviewed journal. The student investigator and principal investigator will submit such a manuscript, based upon the issues raised by the study. (See Chapter 4).

ABSTRACT

Teaching Preventive Safety Skills to Preschool

Children with Disabilities: Direct and
Observational Learning Effects

by

Marion Tso, Doctor of Philosophy

Utah State University, 1999

Major Professor: Sarah Rule, Ph.D.
Department: Special Education

This study examined the direct and observational learning effects of a multicomponent teaching procedure on the acquisition, generalization, and maintenance of preventive safety skills in preschool children with disabilities. Twelve preschool aged children with disabilities from six different classrooms participated. Preventive safety skills consisted of recognizing exemplars of an unsafe situation (obstacles in movement pathways) and changing it in order to make it safer. Responding to unsafe situations was measured in two settings: classroom and home. During teaching, which occurred in the classroom, one of a pair of children was instructed using a multicomponent teaching procedure that incorporated time delay, prompts, and praise. The other child observed. A multiple probe design across pairs of children was used to assess the effects of the procedure for the child who was instructed and the child who observed.

Learners who were directly taught correctly completed more preventive steps during teaching than baseline sessions and showed some generalization of

responding to unsafe situations when the student researcher was not present. Learners who observed the instruction did not respond to classroom probes after watching the target learner during teaching sessions; however, when an extra cue was provided, three of these learners correctly responded to unsafe situations. No learner consistently responded to unsafe situations set up during home probes before or after the teaching that occurred at school.

Results of this study are discussed in terms of: (a) target and observational learners' responses to unsafe situations as a result of teaching, (b) generalization of skills to the home setting, (c) evidence of maintenance, (d) reliable implementation of teaching procedure, and (e) parents' and teachers' responses to the research.

(120 pages)

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Marion Tso

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The opinions expressed here are those of the Project personnel. No official endorsement of the U.S. Department of Education or Office of Special Education and Rehabilitative Services should be inferred.

CONTENTS

	Page
ABSTRACT	iii
ACKNOWLEDGMENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
CHAPTER	
I. INTRODUCTION	1
Problem Statement	1
Review of Literature	3
Summary	13
Purpose and Research Questions	14
II. METHOD	16
Participants	16
Selection Process	17
Setting	18
Materials	19
Selection of Target Skills: Pre-Study Focus Group	20
Variables and Measures	20
Experimental Design	26
Data Collectors and Training	32
III. RESULTS	37
Reliability for Dependent Measures	37
Responses During Variations in Instruction	52
IV. DISCUSSION	61
Major Conclusions	61
Limitations	72
Implications for Future Research	74
REFERENCES	76
APPENDICES	81
Appendix A: Parent Consent Form	82

Page

Appendix B: Assessment Form	84
Appendix C: Response Definitions and Data Collection Procedures	87
Appendix D: Data Collection Form for Responding to Unsafe Situations	92
Appendix E: Checklist for Implementation of Intervention Procedure	94
Appendix F: Intervention	96
Appendix G: Accident/Injury Log	99
Appendix H: Teacher and Parent Letter and Questionnaires	102
Appendix I: Percent of Sessions Score and Interobserver Agreement for Responding to Unsafe Situations	106
Appendix J: Teacher Comments	109
VITA	112

LIST OF TABLES

Table	Page
1. Studies that Examined Children's Safety-Related Skills	4
2. Studies that Used Constant Time Delay (CTD) with Preschoolers with Disabilities	9
3. Studies that Used Constant Time Delay (CTD) and Assessed Observational Learning	10
4. Age and Gender of Participants	17
5. Examples of Materials Used in Classroom and Home Settings	19
6. Examples of Unsafe Situations in each Setting	21
7. Data Collectors and their Responsibilities	34
8. Summary Data on Interobserver Agreement (IOA) by Child	42
9. Interobserver Agreement (IOA) about Correct Implementation of Teaching Procedure for each Target Learner	57
10. Treatment Fidelity for each Target Learner Expressed as Percent of Correctly Implemented Components	57
11. Number and Percent of Children's Correct Responses Followed by Praise and Adult Who was Expected to Provide Praise	58
12. Parents' Responses to Questionnaire (n = 9)	59
13. Teachers' Responses to Questionnaire (n = 4)	60
14. An Example of a Matrix Model to Teach Appropriate Responses to Specific Objectives and Locations of Unsafe Situations	70

LIST OF FIGURES

Figure		Page
1.	Multiple probe design across dyads showing experimental conditions . . .	27
2.	Responses to unsafe situations by session across experimental conditions: Dyads A and B	38
3.	Responses to unsafe situations by session across experimental conditions: Dyads C and D	39
4.	Completion of Step 2 (moving object from pathway and putting it away) by session across experimental conditions: Dyads A and B	40
5.	Completion of Step 2 (moving object from pathway and putting it away) by session across experimental conditions: Dyads C and D	41
6.	Percentage of sessions across settings and conditions during which target learners correctly completed each step	43
7.	Responses to unsafe situations by children who were not taught	47
8.	Percentage of probe sessions during which children who did not participate in teaching correctly completed each step	48
9.	Percentage of sessions across settings and conditions during which observational learners correctly completed each step	48
10.	Completion of Step 2 (moving object from pathway and putting it away) by children who were not taught	54

CHAPTER I

INTRODUCTION

Problem Statement

Unintentional injuries and accidents are a leading cause of death and disability for children in the United States (Lewit & Baker, 1995). Situations that are likely to result in injuries can be classified into two groups according to the frequency with which they are likely to occur. The first group includes unsafe situations that do not occur frequently such as fires, automobile accidents, and stranger abductions. Injuries that might result from the above situations can be quite severe and even life threatening. Some research studies have addressed teaching persons with disabilities to respond to situations that are likely to occur infrequently (e.g., safe responses to the lures of strangers, see Miltenberber & Olsen, 1996). The second group of unsafe situations are those that are likely to occur frequently, yet the probability that injuries will occur is not as great, and if injuries occur, they might not be as severe. Situations in this category include toys on stairs, liquid on floors, and sharp objects left out where children play. Some studies have examined teaching children who are typically developing to respond to unsafe situations that may occur frequently. For example, Peterson (1984a, b) and Peterson and Mori (1985) examined ways to teach children how to identify and respond to unsafe situations at home when parents were not present. However, no studies have examined teaching young children with disabilities to identify and respond to unsafe situations that may occur frequently.

The National Safety Council (NSC; 1995) reported that falls were the leading cause of injury-related emergency room visits in 1992 for children under 15 years of age. Furthermore, Huber, Marchand-Martella, Martella, and Wood (1996) surveyed parents and teachers involved in a Head Start program for information about the frequencies of accidents and injuries for children enrolled in the program. The most frequently reported accidents/injuries were due to falling over objects, falling due to ice or water, and slipping in the bath tub. Collins, Wolery, and Gast (1991) generated a list of safety skills based on survey responses from special educators and parents of children with disabilities. They identified several safety skills as important for preschoolers with special needs to acquire. These included careful movement on wet floors, not leaving toys on stairs, and not eating foods on the floor or ground. One way to reduce accidents and injuries is to identify and teach specific skills such as these that may lead to their prevention.

Effective and efficient interventions that focus on teaching preschool-aged children how to prevent accidents and injuries need to be investigated. If instruction for preschool children with disabilities is to be effective, efficient, functional, and normalized, it must be comprised of natural and nonintrusive procedures (Bailey & McWilliam, 1990). Time delay is one such procedure. Since time delay procedures have been used to teach preschoolers a variety of skills and have been used in small group formats that resulted in observational learning, it is a promising procedure for teaching preventive safety skills to young children with disabilities. The purpose of this study was to examine the direct and observational learning effects of a multicomponent procedure that included time delay on the acquisition, generalization, and maintenance of preventive safety skills by preschool children with disabilities.

Review of Literature

Teaching Safety Skills to Persons with Disabilities

Children's safety issues are addressed in a growing literature base (see Agran, Marchand-Martella, & Martella, 1994). Most studies addressed teaching safety-related skills to children who were typically developing. However, children with disabilities are at more risk for accidents and injuries than those who are typically developing because of various skill deficits and physical health problems (Marchand-Martella, 1994). Limited research addresses teaching safety skills to these children. Table 1 presents selected studies that focused on teaching children safety skills. Studies were included in this table if they met the following criteria: (a) taught safety-related skills and (b) included children under 12 years of age. Most of these studies (78%) concentrated on teaching children who were typically developing. Only 4 of 18 studies included children with disabilities, two of which included preschool-aged children. When research studies addressed teaching safety skills to children with disabilities, they addressed unsafe situations that are not likely to occur frequently such as appropriate responses to the lures of strangers. Thus, additional research is needed to teach young children with disabilities safety-related skills, especially responses to situations that occur frequently.

Studies in Table 1 that addressed teaching safety skills to children have incorporated various intervention strategies. These have included the use of stories and videos (Lehman & Geller, 1990); games (Peterson, 1984a, b); behavioral techniques such as modeling, rehearsal with feedback, and social reinforcement (Christensen, Lignugaris/Kraft, & Fiechtl, 1996; Jones & Kazdin, 1980; Marchand-Martella, Huber, Martella, & Wood, 1996; Poche, Brouwer, & Swearingen, 1981); a

Table 1

Studies that Examined Children's Safety-Related Skills

Reference	Participants	Safety-related skills	Intervention
Carroll-Rowan & Miltenberger (1994)	4-5 years TD	Response to lures of strangers	Compared videotape and manual training
Christensen, Lignugaris/Kraft, & Fiechtl (1996)	3-5 years DD ¹	Response to simulated injuries	Modeling with feedback
Collins & Griffen (1996)	8-11 years Mental retardation	Responses to product warning labels	Constant time delay
Connelly, Isler, & Parsonson (1996)	7-9 years TD ²	Judgement of safe crossing gaps	Descriptive study
Gast, Collins, Wolery, & Jones (1993)	3-5 years DD	Response to lures of strangers	Constant time delay
Jones & Kazdin (1980)	3-6 years TD	Make emergency phone calls	Compared behavioral training and teacher-devised method
Lehman & Geller (1990)	K-5th grade TD	Seat belt use	Story and skit performed for parents
Marchand-Martella, Huber, Martella, & Wood (1996)	4 years TD	Response to lures of strangers	Modeling, behavioral rehearsal, and social reinforcement
Marchand-Martella, Martella, Christensen, Agran, & Young (1992)	6-12 years with disabilities	Treatment of abrasions	Modeling on self and puppets
Miltenberger & Thiesse-Duffy (1988)	4-7 years TD	Response to lures of strangers and sexual abuse situations	Curriculum ("Red Flag, Green Flag") and 1:1 training
Miltenberger, Thiesse-Duffy, Suda, Kozak, & Bruellman (1990)	4-7 years TD	Response to lures of strangers and sexual abuse situations	Parent training using curriculum ("Red Flag, Green Flag") and expert training at home

(table continues)

¹ DD = Developmentally delayed² TD = children were typically developing

Reference	Participants	Safety-related skills	Intervention
Peterson (1984a)	8-9 years TD	Responses to emergencies and lures of strangers Developing safe daily habits	"Safe at Home" game
Peterson (1984b)	7-9 years TD	Responses to dangerous situations at home	Compared two programs ("Safe at Home" and "Prepared for Tomorrow")
Peterson & Mori (1985)	7-9 years TD	Responses to dangerous situations at home	Discrimination training and problem solving
Poche, Brouwer, & Swearingen (1981)	3-5 years TD	Responses to lures of strangers	Modeling, behavioral rehearsal, and social reinforcement
Poche, Yoder, & Miltenberger (1988)	5-7 years TD	Responses to lures of strangers	Videotape program
Rosenbaum, Creedon, & Drabman (1981)	4-5 years TD	Identify emergency situations and make emergency telephone calls	Videotaped scenes, modeling, and feedback
Wurtele, Currier, Gillispie, & Franklin (1991)	3-5 years TD	Responses to situations involving sexual abuse	Parents' implementation of "Behavior Skills Training Program"

combination of videotaped program and behavioral rehearsal (Poche et al., 1988; Rosenbaum et al., 1981); and constant time delay procedures (Collins & Griffen, 1996; Gast et al., 1993).

Only two studies that addressed safety issues included preschool aged children with disabilities (Christensen et al., 1996; Gast et al., 1993). Using a constant time delay procedure Gast et al. (1993) taught four preschoolers with disabilities to avoid the lures of strangers. During the first teaching session an adult explained the importance of saying "no" to strangers; then the child watched adults role play and model how to respond to a stranger's lure. Each training session consisted of three simulated trials. During the first session prompts were provided immediately following the stranger's lure (verbal statement), with a 0-second delay. After the first session, prompts were provided following a 3 second interval from the stranger's lure. Generalization probes were conducted with novel strangers in community settings.

Results indicated that all the children learned how to respond to strangers' lures during classroom simulations; however, generalization of these skills did not occur with novel strangers in community settings. The authors suggested that future research might address using this type of teaching procedure in more natural settings rather than using simulated classroom situations and that the constant time delay procedure be used to teach other safety-related skills.

Christensen et al. (1996) taught three pairs of preschoolers with developmental delays to seek adult assistance when injured. Injuries were simulated cuts. Teaching procedures consisted of three parts. First, one member of the dyad (target learner) received direct training when an adult modeled the steps for seeking adult assistance when injured. The steps included:

- (a) cover injury...with clean cloth, paper towel, or hand; (b) elevate injury above the heart; (c) seek a supervising adult, (d) continue to cover the injury while seeking a supervising adult; (e) continue to elevate the injury while seeking a supervising adult; and (f) show or tell a supervising adult about the injury. (p. 7)

During the second part of teaching, the target learner was told to practice seeking adult assistance while the other member of the dyad (observational learner) watched. An adult praised the target learner for correct responses and the observational learner was prompted to watch what the target learner did. The final part of the teaching procedures consisted of testing the target and observational learners separately to see how they responded to a simulated cut when no feedback was provided. Results indicated that all of the target and observational learners acquired the skill of seeking adult assistance when injured. Furthermore, these skills generalized to home and school playground settings and maintained during probes conducted eight weeks after intervention ended. In this study, the observational learners watched only part of the teaching procedure for the target learner because the target learner received some direct training without the presence of the observational learner.

Teaching young children with disabilities to identify and alter unsafe situations that occur frequently is important for several reasons. First, injuries may be prevented because unsafe situations have been altered. Second, statistics on the number of young children who are treated in emergency rooms for injuries from falls (NSC, 1995) suggests that teaching children to identify and alter situations where someone might fall and get hurt might reduce the number of emergency room visits required. Third, parents and teachers of preschool children with disabilities have identified this as an important skill for these children (Huber et al., 1996; Collins et al., 1991).

Instructional Strategies for Young Children with Disabilities

Many issues bear upon the selection of instructional strategies to teach new skills to young children with disabilities. Procedures should be effective and efficient, do no harm, encourage independence, address children's response patterns and learning histories, and use natural and nonintrusive procedures (Bailey & Wolery, 1992; Bailey & McWilliam, 1990; Wolery, Bailey, & Sugai, 1988). Natural and nonintrusive procedures are those that can be used in the child's daily environment and within his daily routines. Strategies should also be normalized (Bailey & McWilliam, 1990; McDonnell & Hardman, 1988). Normalized means that strategies should incorporate teaching across skill areas and settings, avoid artificial reinforcement, promote child-initiated responding, and support the parent's role (McDonnell & Hardman, 1988). One type of instructional strategy that has been shown to address the issues mentioned above is time delay.

Time delay. Both progressive (PTD) and constant time delay (CTD) have been used to teach a variety of skills to preschoolers with disabilities. Bailey and Wolery (1992) describe the constant time delay procedure:

the teacher initially presents the target stimulus simultaneously with a controlling prompt followed by an opportunity to respond for a specified number of trials....For subsequent trials, the interval between the delivery of the target

stimulus and presentation of the prompt is increased for a fixed number of seconds. (p. 170)

Progressive time delay procedures differ from constant delay only in terms of the "interval between the delivery of the target stimulus and the presentation of the prompt" (p. 171). This interval is gradually increased. Ault, Gast, and Wolery (1988) compared CTD and PTD for teaching children with mental retardation to read words found on community signs. They reported that both procedures were effective for teaching all children the target words. However, CTD was slightly more efficient than PTD for some of the children.

CTD has been found to be both effective and efficient for teaching preschoolers with disabilities sight word reading (Doyle, Wolery, Gast, Ault, & Wiley, 1990), self help skills (Schoen & Sivil, 1989), responding to the lures of strangers (Gast et al., 1993), and self-feeding (Collins, Gast, Wolery, Holcombe, & Leatherby, 1991). Table 2 presents information from selected studies that used CTD procedures to teach skills to preschoolers with disabilities.³ Furthermore, CTD has been shown to be effective and efficient when used in small group contexts. In several studies, students' observational learning of nontargeted responses was assessed (Doyle, Gast, Wolery, Ault, & Farmer, 1990; Griffen, Wolery, & Schuster, 1992; Keel & Gast, 1992; Wolery, Ault, Gast, Doyle, & Griffen 1991). Table 3 presents information from studies that used CTD procedures in small group formats and assessed observational learning. These studies reported favorable outcomes both for learners who received instruction directly and for learners who observed the instruction. Two of these studies involved preschool aged children with disabilities (Alig-Cybriwsky, Wolery, & Gast, 1990; Schoen & Sivil, 1989).

³ Two additional studies that used CTD procedures to teach skills to preschoolers with disabilities are included in Table 3 rather than Table 2 because they also assessed observational learning (Alig-Cybriwsky, Wolery, & Gast, 1990; Schoen & Sivil, 1989).

Table 2

Studies that Used Constant Time Delay (CTD) with Preschoolers with Disabilities

Reference	Participants	Target skills	Results
Chiara, Schuster, Bell, & Wolery (1995)	8 children, 3 had identified developmental disabilities (3-5 years old)	Expressive verbal labels of pictures	CTD is effective when used in groups with massed trials and used individually with trials spread throughout the day.
Collins, Gast, Wolery, Holcombe, & Leatherby (1991)	2 preschoolers with severe disabilities (3 years old)	Self-feeding tasks (spoon use, cup use, and napkin use)	Mixed results: CTD effective for teaching 2 self-feeding tasks for one child and 1 self-feeding task for the other child.
Doyle, Wolery, Gast, Ault, & Wiley (1990)	3 preschoolers w/ developmental delays (4-6 years old)	Oral reading of sight words	CTD effective for teaching oral reading of sight words. CTD slightly more efficient than a system of least prompts procedure for teaching oral reading of sight words. Some generalization across people and task stimuli.
Gast, Collins, Wolery, & Jones (1993)	4 children with disabilities (3-5 years old)	Responding to the lures of strangers	CTD effective for teaching children to respond to lures of strangers in simulated training sessions. New skills did not generalize to community settings.
Werts, Wolery, Holcombe-Ligon, Vassilaros, & Billings (1992)	3 children with hearing impairments (3-4 years old)	Name shapes and colors	CTD used in single trials only during transition times was effective for teaching children shapes and colors. Some generalization across people and task stimuli.

Table 3

Studies that Used Constant Time Delay (CTD) and Assessed Observational Learning

Reference	Participants	Target skills	Number of children in group	Results
Alig-Cybrisky, Wolery, & Gast (1990)	4 preschool and kindergarten children with developmental delays	Discrete Tasks: Expressive word reading	4	CTD effective in teaching sight word reading. Some children learned words identified for other students in the group Specific attending responses produced greater effects than general attending responses
Doyle, Gast, Wolery, Ault, & Farmer (1990)	4 high school students with disabilities in self-contained class	Discrete Tasks: Identify local and federal service and government agencies and over-the-counter medications	4	CTD effective in teaching all students to identify targeted facts. Some students learned some facts through observation.
Griffen, Wolery, & Schuster (1992)	3 students with moderate mental retardation (10-13 years old)	Chained Tasks: Making a milkshake, scrambled eggs and pudding	3	CTD effective in teaching students to complete chained tasks. Students learned to complete steps of chained tasks by watching one student receive direct instruction using CTD.
Keel & Gast (1992)	3 fifth grade students with learning disabilities (11-12 years old)	Discrete Tasks: Identify vocabulary words	3	CTD effective for teaching students to identify targeted words. Students learned words that were directly taught to other children in the group.

(table continues)

Reference	Participants	Target skills	Number of children in group	Results
Schoen & Sivil (1989)	8 preschoolers with developmental disabilities (2-5 years old)	Chained Tasks: Making a sandwich and getting a drink of water	2	CTD effective for teaching both tasks for target and observational learners. CTD slightly more efficient than an increasing assistance procedure.
Wolery, Ault, Gast, Doyle, & Griffen (1991)	4 students with moderate mental retardation (Ages 10-12 years)	Chained Tasks: making eggnog, cleaning overhead transparencies, making a fudge shake, cleaning a sink, folding clothes, and/or preparing envelopes for mailing.	2	CTD effective for teaching students chained tasks in dyads. Students learned high percentage of steps taught to other student.

Observational learning. The law mandates services be provided in the least restrictive environment (PL 94-142), which indicates that students should be served in settings that include their typically developing peers. Furthermore, instruction for young children with disabilities should be provided in the most normal and natural environments (Bailey & McWilliam, 1990). These environments are likely to include peers who may act as models for children who are learning new skills. Thus instructional strategies that promote observational learning might be desirable. As a teacher instructs one child, others may learn from observing the instruction (Christensen et al., 1996; Doyle et al., 1990; Griffen et al., 1992; Schoen & Sivil, 1989; Wolery et al., 1991). Schoen and Sivil (1989) compared two procedures for teaching preschoolers with developmental delays to make a snack and get a drink. Preschoolers were paired so that one was directly taught using either an increasing assistance prompting procedure or constant time delay while the other observed. For

both target and observational learners, constant time delay proved to be more effective than the increasing assistance procedure.

In order for children to learn from watching others acquire new skills, they should have a certain level of imitative ability (Browder, Schoen & Lentz, 1986-87; Schoen & Sivil, 1989). For example, a child should be able to imitate responses of a model without direct instruction and after the model has been withdrawn. In addition, Browder et al. (1986-87) identified other factors to promote observational learning. First, the child should use skills she already applies in other situations or circumstances. For example, if a child is to learn to get a drink, she should be able to complete each step (i.e., get a cup, turn on the water, fill the cup, etc.) before learning the sequence by watching another child do it. Second, during intervention, the child's attention should be directed to the critical features of the thing or event that she is expected to respond to in absence of the model. Third, the child should perceive that the consequences for completing the target skills are present even though the model is absent. It is ideal if natural consequences serve as reinforcers for the observers' responses. Natural consequences are those that are likely to occur following the child's response and may help maintain the target response when the intervention is no longer implemented. For example, praise would be a natural consequence for a child's telling a teacher that he did something appropriate.

Whitehurst (1978) discusses observational learning in terms of similarities in response topography, functional outcome, and/or discriminative context. Within this context, observational learning may occur in regard to (a) the topography of the model's and observer's responses, (b) the functional outcome of the model's and observer's behavior, or (c) the discriminative stimuli that precedes a response; that is, the observer discriminates the relevant stimuli under which the model responded and responds only when the same stimuli are present. When teaching children to respond to unsafe situations, a critical step for the learner is to respond to the unsafe situation

itself rather than an adult such as a teacher. In terms of observational learning the observer needs to discriminate the unsafe situation in which he saw the target learner respond to and then respond similarly. These responses may or may not be the same topography; however, the functional outcome of the responses should be similar. Specifically the learner needs to respond when he encounters an unsafe situation. His response might be to tell an adult, alter the situation independently, or ask an adult to help alter the situation. The outcome of the learner's response is similar in that the situation is altered so that it is no longer unsafe.

Summary

This study addressed the need for additional research on teaching safety-related skills to preschoolers with disabilities. Limited research was available on which to base procedures for teaching safety-related skills to preschoolers with disabilities. This study examined an intervention that incorporated procedures that have been described in the literature as effective for teaching young children with disabilities and procedures that might enhance observational learning. These included a constant time delay, verbal and physical prompts, praise for correct responses, and attentional cues for the observer.

Constant time delay procedures have been shown to be effective to teach new skills in both individual and group formats (Alig-Cybriwsky et al., 1990; Collins et al., 1991; Gast et al., 1993). When constant time delay was used in group formats and instruction was carefully designed, observational learning occurred for nontargeted responses (Alig-Cybriwsky et al., 1990). Constant time delay has been effective for teaching preschool children functional skills such as food preparation (Schoen & Sivil, 1989) and self-feeding (Collins et al., 1991). Constant time delay procedures can also be used in natural environments and capitalize on the natural consequences that are

likely to be available. Children with disabilities can acquire new skills by watching peers perform skills or the implementation of instruction.

Purpose and Research Questions

The purpose of this study was to examine the direct and observational learning effects of a multicomponent instructional procedure on the acquisition, generalization, and maintenance of preventive safety skills in preschool children with disabilities. Children participated in pairs. One child was instructed using a procedure that incorporated time delay, verbal and physical prompts, and praise. The other observed; the only direct intervention for this child was cues to watch or listen. This study measured the following: (a) the acquisition of preventive safety skills by the target and observational learners of each pair, (b) generalization of skills to other settings and the presence of other people, (c) continued performance of the acquired skills after periods of no teaching, and (d) the reliable implementation of the procedure within the natural context of a preschool classroom. The research questions of this study were:

1. What were the effects of teaching preschool children with disabilities to respond to unsafe situations by using a multicomponent intervention procedure (time delay, prompts, praise, and attentional cues)?
2. What were the effects on an observational learner who watched the multicomponent procedure implemented with the target learner?
3. Given that teaching resulted in a child's correctly completing steps for responding to unsafe situations, did responding maintain after periods of no teaching?
4. Given that teaching resulted in a child's correctly completing steps for responding to unsafe situations at school, did responding generalize to unsafe situations at the child's home or at school with other adults present?

5. Could the multicomponent intervention be implemented reliably within the daily routines of the classroom?

CHAPTER II

METHOD

Participants

Twelve preschool-aged children with developmental delays enrolled in six different classrooms participated in this study. Children were selected based on the following criteria: (a) child received special education services as described in his or her Individualized Education Program (IEP), (b) parental consent was obtained and a parent/caregiver agreed to participate by collecting data at home (see Consent Form, Appendix A), (c) child imitated basic motor and verbal responses (see Assessment Form, Appendix B), (d) child was ambulatory (i.e., moved from place to place independently), (e) child communicated skillfully enough to identify and report simple information and (e) child did not perform the targeted skills at the beginning of the study, as assessed during baseline probes.

Each child who participated in this study received preschool special education services during the time the study was conducted. In order to receive preschool special education services in the state of Utah, a child must be classified as having a developmental delay. A child has a developmental delay if he or she has a significant delay or deficit in one or more areas of development. These areas include cognitive, physical, motor, communication, social/emotional, adaptive, and vision or hearing (Bean, 1993). The age and gender of each child who participated in this study are presented in Table 4. Their ages ranged from 3 years, 9 months to 5 years, 6 months with a mean of 4 years, 4 months. English was the primary language for eleven of the children and Spanish for one child (Observational Learner B). One of the data

Table 4

Age and Gender of Participants

Child	Gender	Chronological age at beginning of study
Target Learner A	M	4 - 9
Observational Learner A	F	3 - 11
Target Learner B	M	3 - 9
Observational Learner B	M	5 - 0
Target Learner C	M	4 - 0
Observational Learner C	M	4 - 8
Target Learner D	M	4 - 1
Observational Learner D	F	5 - 6
Child E	F	4 - 4
Child F	M	4 - 7
Child G	M	3 - 11
Child H	M	4 - 0

collectors communicated in Spanish with Observational Learner B's parents and translated all forms into Spanish.

Two children from each classroom were grouped into dyads because instruction was designed to teach one child directly while the other watched.

The student researcher conducted this study. Four undergraduate students were hired to assist with the data collection procedures.

Selection Process

Four preschool special education classroom teachers participated in this study. Each teacher agreed to identify children and allow the student researcher to come into her class throughout the year to teach children who participated in the study. Each of

the four teachers was in charge of two self-contained morning and afternoon classes for preschool children with developmental delays. Two teachers agreed to participate during both of their classes and two teachers during only one of their classes. The teachers were asked to identify two to four children in these respective classes who might benefit from learning how to respond to unsafe situations. If a teacher identified more than two children, two were randomly selected from those that the teacher identified. Two children were identified in four classes, three children in one class, and four in another. The student researcher gave consent forms to the teachers and each teacher sent home a consent form with a self-addressed return envelope to the parents of children she had identified. The consent form stated that real names would not appear in any report and that participation in the study would not affect a child's class standing. After the consent form was received a preassessment was conducted with the child at school. The purpose of this assessment was to determine if the child could imitate basic motor and verbal responses, was ambulatory, and communicated enough to identify and report simple information (assessment form included in Appendix B). Consent was obtained for all children that teachers initially selected. All met the selection criteria based on the results of the preassessment.

Setting

The student researcher (and for two children who learned the responses, a second adult) taught safety skills during daily activities in each of the preschool classrooms. These included arrival, departure, free play and transitions between or within activities (e.g., child puts papers in their cubby). Data collectors conducted probes during daily activities in the classrooms and at each child's home. Probes and

teaching sessions were scheduled during activities such as transitions when children might be expected to attend to safety-related issues.

A tripod and video camera were present in each classroom. The video camera was set up periodically throughout the day. In four of the six classrooms, university practicum students used these same cameras at different times of the day to record interactions with children. Probes conducted in children's homes were scheduled during times convenient for parents. No video cameras were present in the homes.

Materials

Materials used in teaching safety skills included toys and objects that were typically present in each setting. Examples of materials used in each setting are listed in Table 5.

Table 5

Examples of Materials Used in Classroom and Home Settings

Classroom	Home
Articles of clothing (i.e., jackets, hats, paint smocks, and so forth)	Articles of clothing (i.e., jackets, shoes, and so forth)
Toys (i.e., musical instruments, stuffed animals, blocks, dolls, and so forth)	Toys (i.e., trucks, stuffed animals, dolls, and so forth)
Books and backpacks	Books and backpacks
Dishes (i.e., cups, plates, bowls, and so forth)	Dishes (i.e., cups, plates, bowls, and so forth)
Trash	
Throw rugs, pillows, blankets	Throw rugs, pillows, blankets
Art materials (i.e., paper, crayons, markers, glue bottles, and so forth)	
Child-sized furniture (i.e., chair, step stool)	Child-sized furniture (i.e., chair, step stool)

Selection of Target Skills: Pre-Study Focus Group

Prior to beginning this study a group of parents and teachers of preschoolers with disabilities was convened to discuss safety-related skills that they thought to be important for children of this age. This was a convenience sample drawn from local preschools. Thirty letters were sent to parents and teachers of preschool-aged children with disabilities soliciting their help in identifying safety skills. The student researcher hand delivered or mailed letters to six teachers who taught at the local schools and asked each teacher to send letters home with children in their classroom whose parents might be interested in participating in the focus group. Parents or teachers who were interested completed a form included with the letter and returned it to the student researcher. Six parents and two teachers responded to the letter, were contacted, and told when the focus group was scheduled. Four parents, one teacher of preschoolers with disabilities, and one former preschool teacher who is also a parent of a child with a disability attended the focus group. Parents and teachers who attended the focus group were paid \$15 for their participation.

The purpose of this group discussion was to generate a list of unsafe situations that preschool aged children with disabilities encounter and, accordingly, the skills that they might be taught to address these situations.

Variables and Measures

Preventive Safety Skills

Preventive safety skills consisted of recognizing an unsafe situation and changing it in order to make it safer. Based upon skills identified in the focus group and in the literature (Huber et al., 1996), unsafe situations in which children might trip

over objects were addressed. Unsafe situations were created by leaving objects in high traffic or common areas. Examples of these situations and appropriate responses to make them safer (target responses) are listed in Table 6.

The dependent variable in this study was the child's completion of a sequence of steps to rectify specific unsafe situations identified in the focus group. The sequence included (a) verbal identification of the unsafe situation, (b) changing the situation to make it safer, and (c) telling someone else that the problem was resolved. Examples of verbal identification responses include, "That car should not be there, I might trip on it;" "Uh-oh, a block is on the step;" and pointing to rug and saying, "Someone might fall on that." Rectifying or changing the situation to make it safer included behaviors

Table 6

Examples of Unsafe Situations in each Setting

Setting	Unsafe situation	Target response
Classroom	Blocks left on floor in the middle of the classroom	Pick up blocks and put them on shelf
	Markers left on floor covering marks where children line up to leave	Pick up markers and put on teacher's desk
	Step stool in doorway to bathroom	Move stool and place under sink
	Jacket left in entry way where students come into the classroom	Pick up jacket and hang on hook
	Throw rug displaced	Straighten rug
Home	Paper towel(s) in bathroom doorway	Pick up paper towel(s) and put in the trash can
	Toys in hallway	Pick up toys and put away
	Child-sized plastic chair in bedroom doorway	Move chair to kitchen area and place next to small table
	Books in middle of hallway	Pick up books and put on book shelf

such as picking up the toy or object and putting it away or giving an object to someone else. It was deemed desirable for the child to tell someone about the unsafe situation and how she resolved it for several reasons. First, telling someone gave the child the opportunity to receive positive attention and praise. This might be an important variable that contributes to the maintenance of this skill. Second, the other person might provide help if needed. Third, these verbal statements might serve as attentional cues for another child to observe the critical features of the situation (Browder et al., 1986-87). Finally, the child might influence others to rectify unsafe situations, perhaps preventing accidents or injuries from falls due to objects.

Measure of the Dependent Variable: Number
Of Steps Completed Without Prompts During
Each Probe Session

During probe sessions in which unsafe situations were created unbeknownst to the child and in areas that he or she would traverse, a data collector recorded whether the child completed each step correctly or incorrectly. A step was recorded as correct if it was completed without prompts. Probes were conducted individually, with one child in the dyad present. The steps for responding to an unsafe situation are described below. The complete response definitions and recording procedures are included in Appendix C.

Step 1: Identification of situation. The child said something about the unsafe situation to an adult (e.g., "Oh, there's a ball in the doorway," "Uh-oh," "oh, a ball"). Questions such as "Who left these skates here?" were also defined as verbal descriptions. Pointing to the object or situation was also scored as identification and coded as nonverbal. The data collector coded which aspects of the situation the child identified: O (object), L (location), or/and S (safety concern).

Step 2: Does something to alter situation to make it safer. This step was recorded if within 3 seconds of completing step #1 or encountering the situation, the child did something to make the situation safer (e.g., independently moved object to a safer place, gave object to someone else, asked someone for help). A partial correct (pc) response was scored if the child picked up the object or moved the object but did not put it in the correct place.

Step 3: Tells someone what she did. This was coded if the child told an adult what she did within 3 seconds of completing step 2 (e.g., "I moved the ball," "No more toys on the stairs").

Appendix D includes the data sheet that was used for recording these behaviors.

Number of steps target learner completed without prompts during each teaching session. In order to assess the child's acquisition of the target skills, during the teaching session a data collector recorded whether the target learner completed each step with or without prompts during a teaching session. For this study a step was recorded as correct if it was completed without prompts. Steps were recorded as incorrect if the child responded correctly after one or more prompts. Responses were scored partially correct if the child completed only part of the step independently. For example, if after putting away an object, a child looked and asked where a teacher was, but never found her to tell her what he did, then a partial correct was scored for the third step. Specific details for scoring children's responses are presented in Appendix C and the data sheet for recording the target learner's responses for responding to unsafe situations during teaching is presented in Appendix D.

Measures of the independent variable: Percentage of teaching components implemented correctly during each teaching session

The independent variables included a time delay, a prompting procedure that incorporated verbal and physical prompts, praise for correct responses, and for the observational learner, verbal attentional cues.

Components implemented correctly. In order to determine if the teaching procedure was implemented as described, observers recorded on a checklist (Appendix E) whether the adult implemented each component of the intervention correctly or incorrectly. The first intervention component of each teaching session was to provide an attentional cue for the observational learner (e.g., "Watch [Target Learner's name] and see what he does"). Intervention components for the first step in the child's response sequence included (a) correct interval of delay between the child's encounter with the unsafe situation and the prompt, (b) attentional cue for the target learner (e.g., point to object and say "look") if necessary, (c) correct prompt if necessary ("Look, there's _____ on/in the _____, someone might fall?"), and (d) behavior specific praise. For the second step, intervention components included (a) correct interval of delay between completing the first step and the prompt, (b) correct prompt if necessary ("you need to move it"), (c) attentional cue for observational learner if necessary ("Look what [target learner's name] is doing"), and (d) behavior-specific praise. Intervention components for the third step included (a) correct interval of delay between completing the second step and the prompt, (b) correct prompt if necessary ("Go tell mom/dad/teacher what you did"), and (c) attentional cue for the observational learner if necessary ("Watch what [target learner's name] is doing"). After the target learner completed the third step, final intervention components

included asking the observational learner, "What did [target learner's name] just do?" and providing a neutral response such as "Thanks for telling me."

All teaching sessions were videotaped. For each target learner, 50% of teaching sessions were randomly selected and scored for percent of intervention components completed correctly. Since sessions were scored from videotapes, it was sometimes difficult for data collectors to see or hear the adult and child responses. In such instances, they scored the component as "can't tell." At least 75% of the components during a teaching session had to be scored in order for the session to be included. If a session was selected to be scored and more than 25% of the components scored as "can't tell," another session was randomly selected to replace it.

Measures of the Independent Variable: Praise

Praise was defined as positive statements provided by an adult during or after completion of any step(s) for responding to an unsafe situation (e.g., "Thanks for telling me what you did," "I like the way you moved the ball"). Adults who provided praise included the student researcher, classroom staff members, and parents. Praise was coded as general or behavior specific. Behavior specific praise was defined as including a verbal referent to completing the step(s) in the sequence. See Appendix C for complete definitions and recording procedures. Praise from others was recorded during all conditions because (a) it was a component of the independent variable, and (b) behavior specific praise might also function as a cue for the observational learner to attend to the consequences for the target learner's responses.

An example of an unsafe situation is presented in Appendix F, with the description of the sequence of child responses, intervention procedures (prompts), and attentional cues.

Experimental Design

A multiple probe design across dyads (pairs of children) (Gast, Skouge, & Tawney, 1984; Horner & Baer, 1978) was used to assess the direct and observational effects of the intervention procedure on the acquisition, generalization and maintenance of preventive safety skills. A multiple probe design is similar to a multiple baseline design in that the intervention is applied sequentially either to one behavior or in one setting or with one subject (in this case a dyad) at a time. Instead of collecting continuous baseline data for all participants, probes are conducted intermittently throughout the conditions of the study. This design is especially useful when (a) participants are likely to react to the continuous measurement process, (b) continuous measurement is impractical, and/or (c) a strong assumption of stability over time during baseline can be made prior to beginning the study (Horner & Baer, 1978). The design is used to evaluate the effects of an intervention on the dependent measures which are represented by probe data (Gast et al., 1984; Horner & Baer, 1978). For this study, a continuous baseline was not very practical since it would require daily data collection for every participant. Furthermore, it was likely that baseline data would be stable. In this study probes were conducted in two settings: classroom and home. Figure 1 shows the multiple probe design across dyads and conditions.

Baseline

During baseline, data collectors set up individual probes and observed each participant (target or observational learner) in each of the two settings (classroom and home) to determine whether or not the child completed any of the preventive safety skill responses without participating in the intervention. Each probe consisted of one opportunity to respond to an unsafe situation and when only one member of the dyad

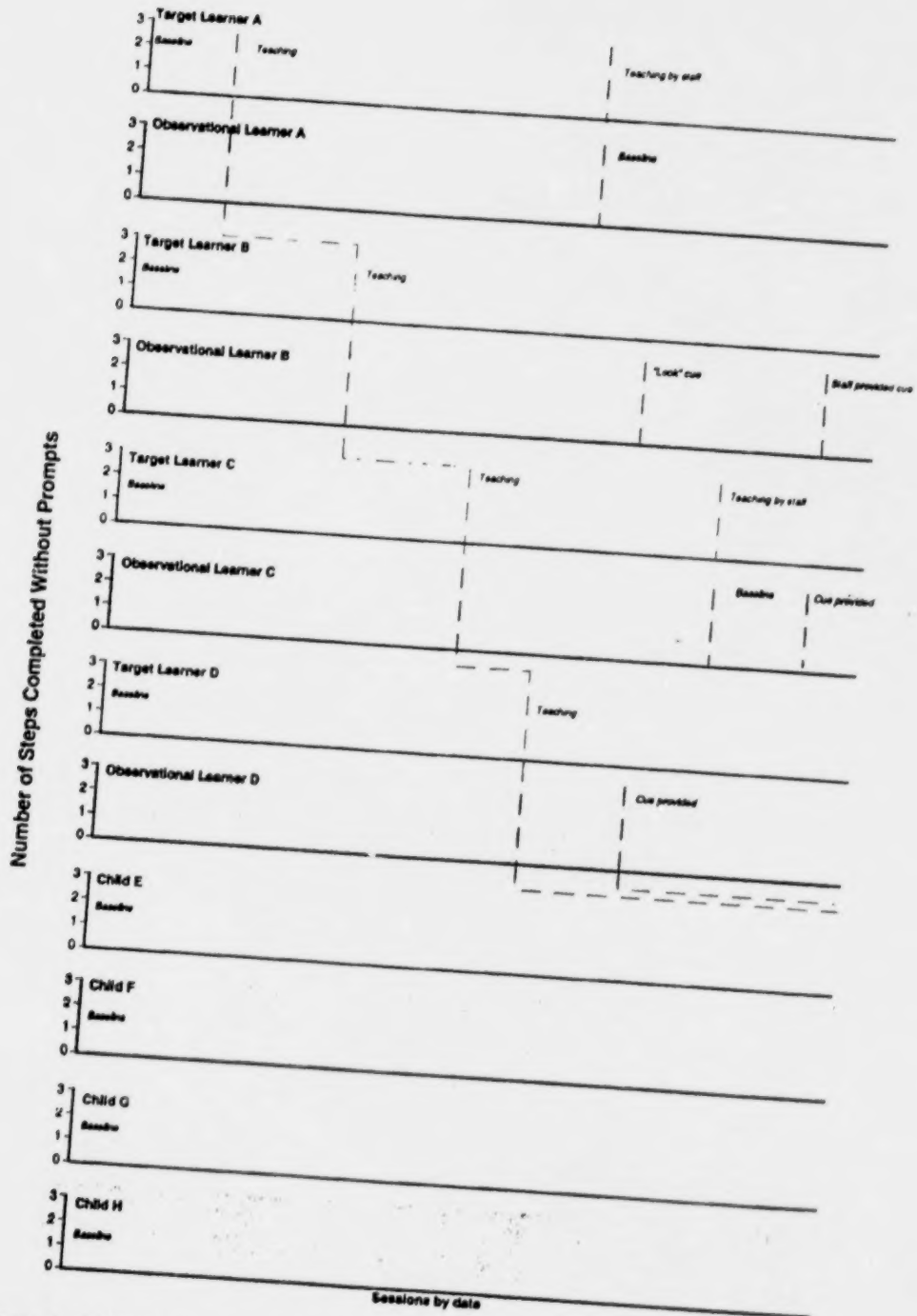


Figure 1. Multiple probe design across dyads showing experimental conditions.

was present thus precluding observational learning. At the beginning of each probe, either a classroom staff member told the child to complete a task (e.g., "go get the book from the table," "time to go inside") that required the child to change locations, or the child was in the process of completing a routine classroom transition; in either case, the child encountered an unsafe situation en route. If baseline data showed that neither member of the dyad completed any of the steps during the previous five consecutive probes, then intervention began for the first dyad.

A data collector was present during all probes; during teaching sessions the student researcher or a classroom staff member was also present. The data collector or student researcher prevented any actual injuries or accidents by blocking access and either redirecting the child to another area or, if intervention was underway, conducting the procedures as appropriate.

Up to three probes (or up to three probes and teaching sessions combined) were conducted for each participant in a given day. A minimum of 10 minutes elapsed between probes or teaching sessions.

Teaching

Each teaching session consisted of one trial during which the adult used the intervention procedure to instruct the target learner while the observational learner watched. When using time delay to teach chained responses, each step of the sequence is prompted and praised (Schuster & Griffen, 1990). Therefore, in this study, each step in the sequence of responding to an unsafe situation was praised and/or prompted.

Teaching sessions occurred at school. The student researcher set up an unsafe situation when the target and observational learners were engaged in a task and not

watching her or what she was doing. At the beginning of each session, the student researcher told the observational learner, "Watch (target learner's name) and see what he does." A classroom staff member then instructed the target learner to complete a task (i.e., "Go get some napkins from the kitchen," "Time to go inside," and so forth) or the student researcher and observational learner waited until the target learner was ready to complete a transition as part of the classroom routine. The target learner then encountered an unsafe situation. For the first three sessions (0 seconds delay) the student researcher immediately prompted the target learner through each step of the sequence; these prompts were provided to promote errorless learning and also to prevent accidents or injuries due to falls. As each step was completed the student researcher provided the target learner with behavior specific praise. After the third teaching session the student researcher waited for 3 seconds before prompting a step. If the target learner did not initiate the sequence on his own, then she prompted him through the first step and waited 3 seconds for the next response. If the target learner started the sequence correctly and then made an incorrect response, the student researcher waited 3 seconds (from end of praise following previous step), prompted the correct response for that step and then waited 3 seconds for the next response. Prompts consisted of verbal and physical help to assure that the learner completed the sequence with as few errors as possible. All correct responses were followed by behavior specific praise.

During teaching, the student researcher cued the observational learner to attend to what the target learner was doing. For example, when the target learner picked up a toy car on the stairs and put it away, the student researcher said, "Watch what he's doing." Immediately after the target learner completed all the steps, the student researcher asked the observational learner, "What did (the target learner) just do?"

She provided a nondescriptive response to the observational learner's answer (i.e., "Thanks for telling me") in order to avoid additional teaching for the observational learner.

Throughout teaching, data collectors conducted probes for the target and observational learners in the classroom and at home to assess changes in behavior in these situations. The data collector who observed a child in the classroom was different from the person who observed in the home. This was a precaution to avoid creating an artifact in the generalization (home) setting of the presence of someone associated with the intervention setting. Classroom probes occurred in the student researcher's absence in order to assess whether children's responses were discriminated to unsafe situations or to the student researcher. Teaching sessions implemented by the student researcher ended when data representing the target learner's responses were stable. Stability was defined as the child's completing Step 2 without prompts for five consecutive teaching sessions.

If the observational learner responded to the unsafe situation after the target learner responded, the observational learner was told to watch the target learner. When this happened, the data collector wrote down a brief description of the observational learner's responses and when they occurred within the response sequence for responding to unsafe situations.

Classroom Staff Member Provides Prompts For Target Learner

For two target learners who did not complete the steps for responding to unsafe situations during classroom probes after consistently completing the steps during teaching, another classroom staff member was asked to conduct intervention with the target learner only. The student researcher described the intervention procedure and

then the classroom staff member implemented it. For each child, the same staff member conducted all of the teaching sessions in this condition. Initially, the student researcher provided feedback to the classroom staff member to ensure that she was providing the appropriate delay, prompts, and praise for correct responses. During these teaching sessions, the observational learner was not present so no cues were directed to the observational learner. Because the target learner's responses might have been discriminated to the student researcher rather than the unsafe situations, this condition was implemented to help the target learner discriminate his responses to the unsafe situations.

Baseline for Observational Learner

An observational learner did not observe teaching sessions when his/her corresponding target learner was prompted by a classroom staff member. Thus, probes conducted during this condition were similar to those during baseline.

Additional Cue for Observational Learner

For three observational learners who did not complete the steps for responding to unsafe situations after the corresponding target learner had demonstrated a stable response pattern for the second step, sessions were conducted with only the observational learner present (a stable response pattern for the target learner was defined as completion of the second step for the last five consecutive data points during teaching). During these sessions, the student researcher pointed to the object and said "look" when the observational learner encountered the unsafe situation. No other prompts were provided. Behavior specific praise was provided for correct responses. This condition was implemented because the teaching procedure may have inadvertently taught the observational learner to watch rather than to respond to

unsafe situations. The teaching procedure included steps that instructed the observational learner to watch. If he tried to do any of the responses, he was interrupted and told to watch the target learner.

Data Collectors and Training

Four undergraduate students were hired to collect data on the dependent and independent measures and set up probes. Training for data collectors occurred prior to collecting baseline data. Training began with a review of written definitions that included examples and nonexamples of all target behaviors. Data collectors practiced collecting data from videotaped segments until criterion for observer training was met. The criterion for concluding training was at least 90% interobserver agreement for each behavioral measure on three consecutive practice sessions.

Development of Observational Procedures

Initially one undergraduate student was hired (Data Collector A) to assist in the development of the dependent and independent measures. Development of these measures started with written definitions that included examples and nonexamples of the target responses. A private preschool in the community and parents of four children who attended the preschool agreed to assist in the development of the measures. The four children were three year olds who were typically developing. Unsafe situations where objects were placed in high traffic areas were created and the children's responses were videotaped. Teaching occurred and the intervention procedure was developed based on the children's responses and variables identified in the review of literature (e.g., time delay, attentional cues for observers, and so forth).

Data Collector A and the student researcher revised definitions and measures until interobserver agreement was at least 90% for three consecutive videotaped sessions for each measure. After recording data from videotapes of children's responses to unsafe situations at the preschool, Data Collector A and the student researcher recorded the target responses live in the children's classrooms until the same criteria were met. Data Collectors B, C, and D were subsequently hired and trained to collect data for each measure. Interobserver agreement was calculated for each new data collector with Data Collector A as the primary observer.

Data Collectors' Responsibilities

When the study began each child was assigned to one data collector for school and another data collector for home. The data collector assigned to the child at school obtained all of the probe data for that child at school and the data collector assigned to the child at home collected all of the probe data for that child at home. Thus, the child never saw the same data collector at home and school. When intervention began for a child, a data collector different from the one who conducted and observed probes recorded the child's responses during intervention. Only the data collector that collected data during the intervention knew which child was the target learner and which was the observational learner. Table 7 illustrates assignment of data collectors across probe and intervention settings. At the end of the school year, three data collectors moved; therefore, the student researcher acted as the secondary data collector during school probes and teaching sessions conducted during July. When the student researcher acted as the secondary data collector, she observed and recorded responses from the videotapes.

Table 7

Data Collectors and their Responsibilities

Child	Data collector	Responsibility
Target Learner A and Observational Learner A	A	Primary data collector during school probes
		Primary data collector during home probes
	B	Primary data collector during intervention and secondary data collector during school probes
	C	Secondary data collector during school probes and intervention
	D	Secondary data collector during probes conducted in the summer
	Student Researcher	Secondary data collector, Summer

Reliability

Reliability was expressed as the percentage of interobserver agreement computed by dividing the number of agreements by the total number of agreements and disagreements multiplied by 100. An agreement was scored when both observers scored the occurrence of the same response. A disagreement was scored if one observer scored an occurrence and the other observer did not or coded a response differently. For example, if one observer scored a child's response as correct and the other observer scored the child's response as correct after the first prompt then a disagreement was scored.

Dependent Measures

Interobserver agreement was measured during at least 25% of all classroom probes and teaching sessions for each participant. Sessions scored for reliability were

randomly selected from the probes and sessions that were videotaped. If the child or adult responses could not be coded from the videotaped segments because of the technical quality (data collector could not see or hear child or adult response) then a step or response was scored as "can't tell." The session was counted only if at least 75% of the components/steps in each session were scored. If too many components (more than 25%) were scored as "can't tell" then that segment was not counted and another segment was randomly selected. Reliability was obtained only for probes conducted at school because only one data collector was present in the home and these probes were not videotaped. The presence at home of an additional data collector or the video camera was judged to be intrusive and might have produced reactivity.

Independent Measure

Reliability for the independent measures was obtained for at least 25% of the teaching sessions scored. Each session was scored for the percentage of intervention components completed correctly. An agreement was scored when both data collectors scored an intervention component the same. A disagreement was scored when data collectors scored a component differently, for example, if one data collector scored a prompt as "not applicable" and the other scored it as "-" (which indicated it was not provided when it should have been).

Ancillary Measure

Data on the occurrence of actual accidents and injuries at home and school were collected throughout this project. Teachers and parents were asked to keep logs of information regarding any accidents or injuries that occurred in their home and to write down if their child did or said anything related to altering unsafe situations. The logs

included information about the extent or severity of injury, cause, place, and any other information deemed relevant. See Appendix G for copy of the forms. Parents and teachers were sent a copy of the logs at the beginning of the study and asked to complete and return them in a self-addressed envelope or give them to one of the data collectors. Whenever parents or teachers completed and returned a log, a new copy was given to them.

Social Validation Measure

Teachers and parents of the children involved in the study were asked to complete a questionnaire about the methods and procedures used in this study. Specifically they were asked to rate on a 5-point Likert type scale the appropriateness and usefulness of the described procedures and the importance of the specific safety-related skills that the children were taught. The questionnaires differed slightly for parents and teachers and are included in Appendix H.

The questionnaires were mailed or hand delivered to parents and teachers by one of the data collectors. A self-addressed stamped envelope was provided so parents and teachers could mail their completed questionnaires at their convenience. After the questionnaires were returned, each parent and teacher was paid \$30 for their participation. Parents and teachers were told not to put their names on the questionnaires.

CHAPTER III

RESULTS

The purpose of this study was to examine the direct and observational learning effects of a multicomponent teaching procedure on the acquisition, generalization, and maintenance of preventive safety skills in preschool children with disabilities. In this chapter, reliability data for dependent and independent measures are presented followed by data that address each research question.

Reliability for Dependent Measures

The dependent measures used in this study were the number of steps correctly completed during probe sessions and teaching sessions, respectively. A step was correct if it was completed without prompts. Reliability was measured for 30% of all teaching and probe sessions. The overall mean percent of interobserver agreement across all children was 95% and the range was 67-100%. Table 8 shows the percent of interobserver agreement for the number of correctly completed steps for each target and observational learner and the percent of sessions and probes scored for interobserver agreement. Data regarding interobserver agreement are presented for each child and condition in Appendix I.

Question #1: What were the effects of teaching that incorporated constant time delay, prompts, praise, and attentional cues on the number of correctly completed steps?

Data representing each target and observational learner's responses to unsafe situations are presented in Figures 2 and 3. Figures 4 and 5 present the target and observational learners' responses to step 2 (moving object and putting it away). Step 2, the essential component of making the environment safe, was graphed separately.

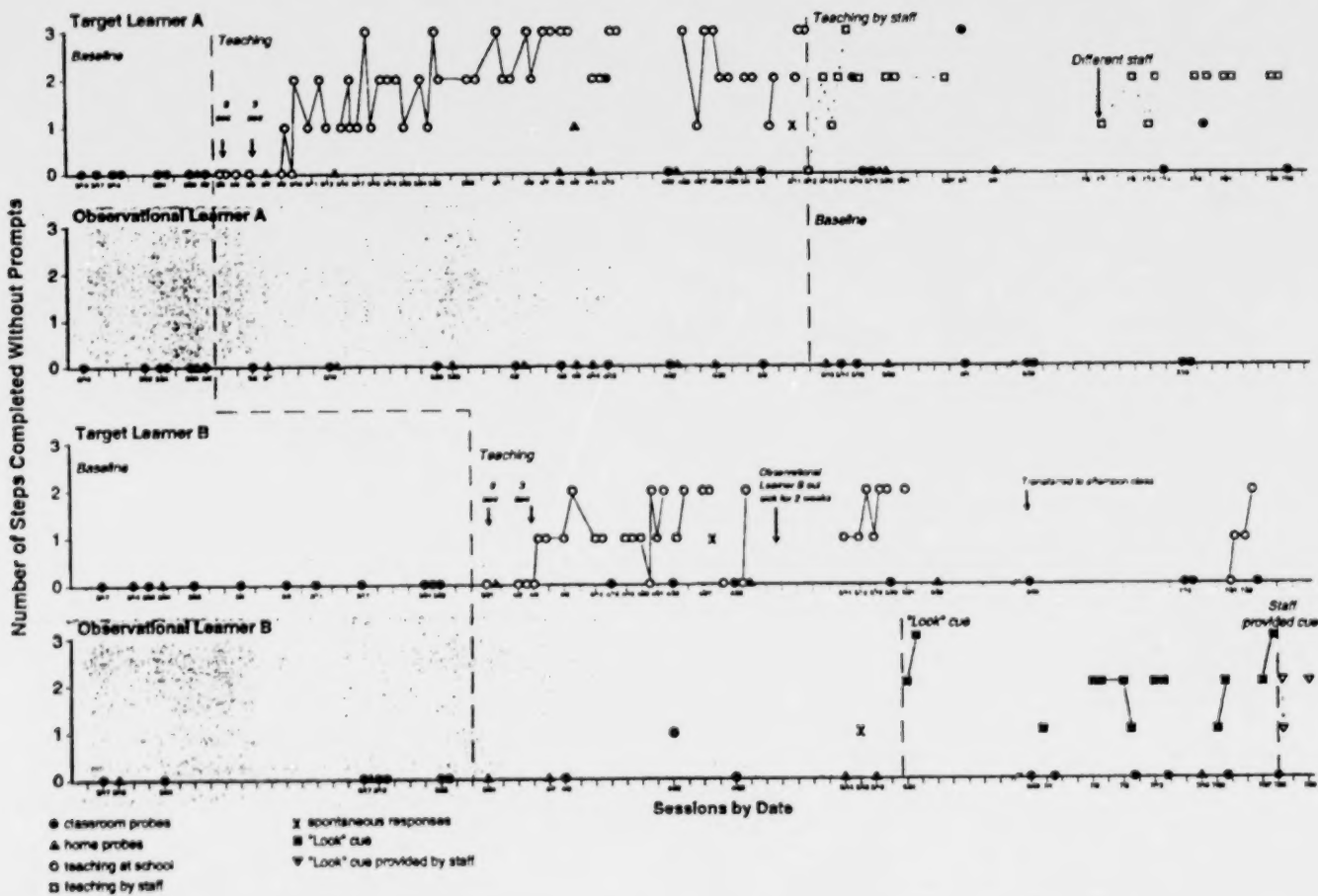


Figure 2. Responses to unsafe situations by session across experimental conditions: Dyads A and B.

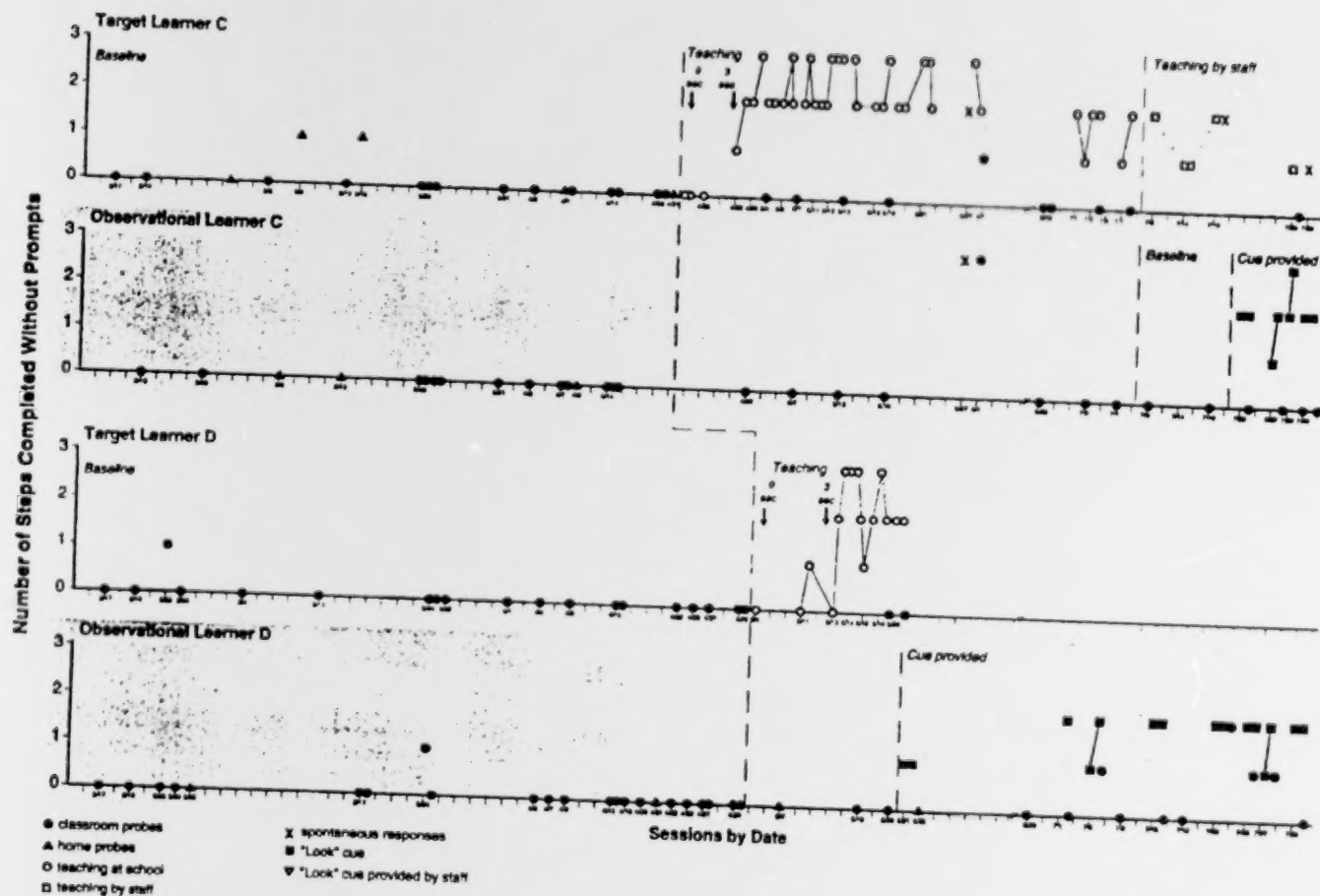


Figure 3. Responses to unsafe situations by session across experimental conditions: Dyads C and D.

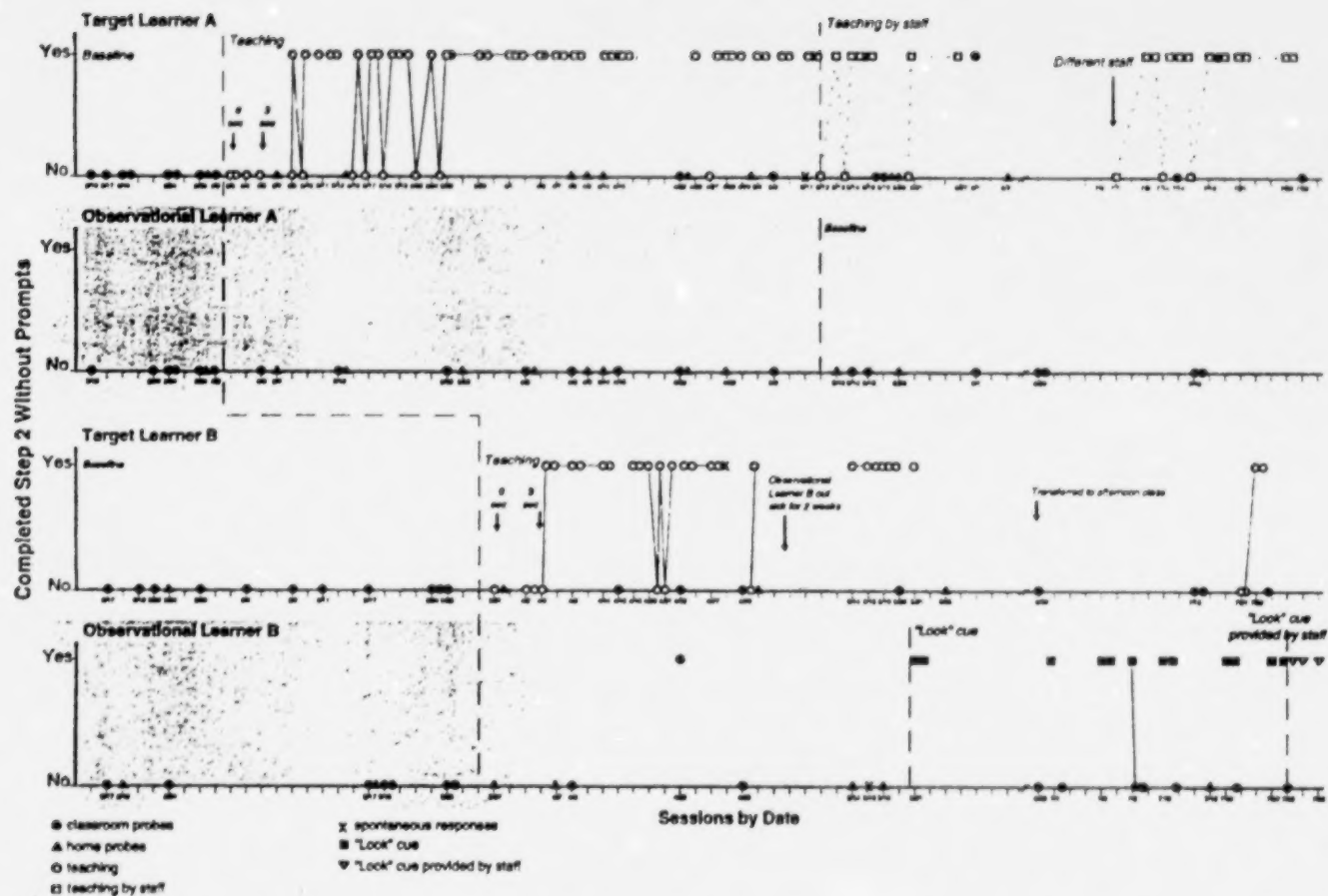


Figure 4. Completion of Step 2 (moving object from pathway and putting it away) by session across experimental conditions: Dyads A and B.

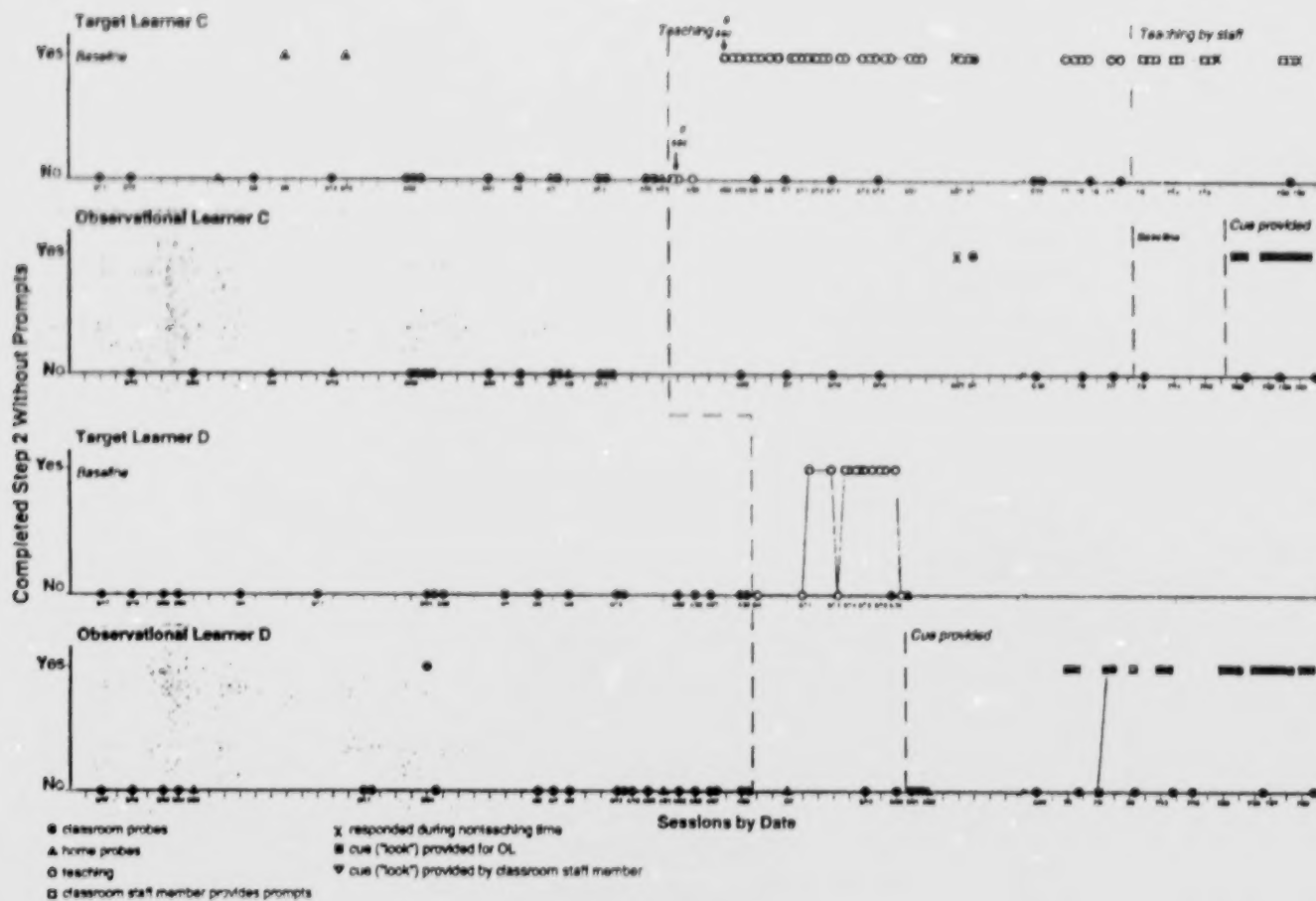


Figure 5. Completion of Step 2 (moving object from pathway and putting it away) by session across experimental conditions: Dyads C and D.

Table 8

Summary Data on Interobserver Agreement (IOA) by Child

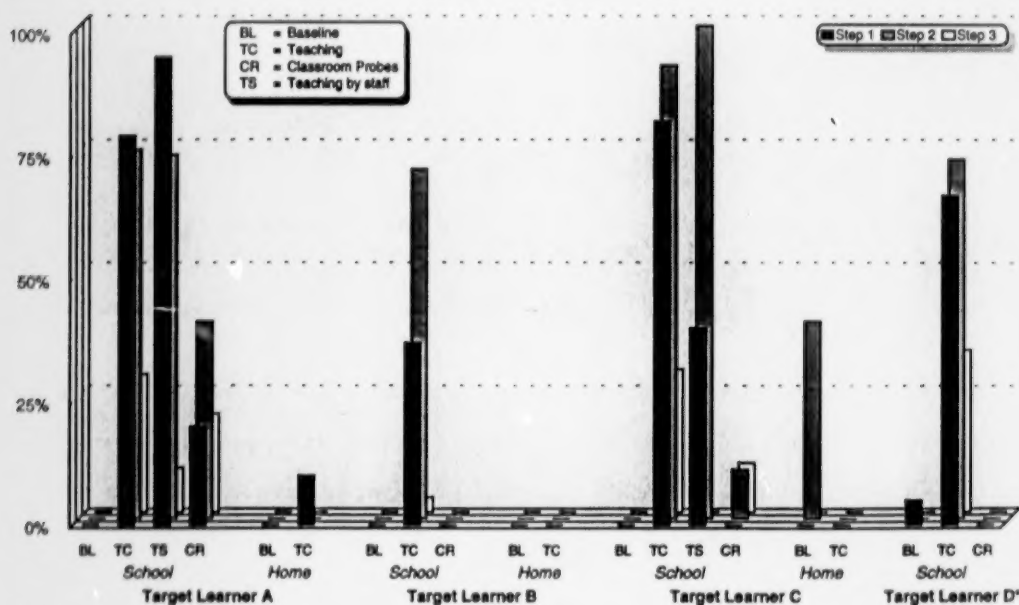
	Percent of Sessions Scored for Reliability	Mean Percent IOA	Range Percent IOA
Target Learner A	24%	89	67-100
Observational Learner A	29%	100	100
Target Learner B	32%	91	67-100
Observational Learner B	33%	94	83-100
Target Learner C	35%	94	80-100
Observational Learner C	37%	97	83-100
Target Learner D	28%	87	61-100
Observational Learner D	22%	100	100
Target Learner E	32%	98	83-100
Observational Learner E	36%	97	93-100
Target Learner F	30%	100	100
Observational Learner F	41%	100	100
Overall Means	30%	95	67-100

environment safe, was graphed separately. Completion of this step was used as the criterion for changing conditions. During baseline, no target learner completed more than one step for responding to an unsafe situation during any probe or consistently completed any one step across probes. When teaching was implemented, each target learner correctly completed one or more steps for responding to an unsafe situation after the 3-second delay was implemented. (During the first three teaching sessions, target learners had no opportunity to respond independently since prompts were provided immediately with no delay, 0 seconds). Two of four target learners correctly completed one or more steps during three or more subsequent probes.

Figure 6 shows the percent of sessions during which target learners correctly completed each step across conditions and settings. During teaching three target learners completed step 2 more often than other steps and one completed step 1 more often than the other steps. During classroom probes conducted after teaching began, one of four target learners correctly completed step 2 more than steps 1 and 3. The other target learner occasionally completed steps 2 and 3. Each target learner's response to unsafe situations is described below.

Target Learner A

Target Learner A did not complete any of the steps for responding to unsafe situations during baseline probes either in the classroom or at home. Teaching began after one home and eight classroom probes were conducted. During the sixth



* No home data were obtained.

Figure 6. Percentage of sessions across settings and conditions during which target learners correctly completed each step.

teaching session, target Learner A began to complete steps without prompts. Once Target Learner A completed a step without prompts, he continued to do so during all but two teaching sessions. The percent of sessions during which he correctly and independently completed steps 1, 2, and 3 were 79%, 75%, and 28%, respectively. When a classroom staff member subsequently provided teaching, Target Learner A's performance maintained or increased on steps 1 and 2 and decreased slightly on step 3.

After 38 teaching sessions, Target Learner A correctly completed steps 1 and 2 during a classroom probe, but did not respond correctly on the next two classroom probes. When teaching was conducted by a staff member he responded correctly during three of seven classroom probes, two of which were in the last four conducted. Once he spontaneously responded by identifying an unsafe situation.

Target Learner B

Target Learner B did not complete any step during the 11 classroom and 1 home baseline probes. He began to make correct, independent responses during the fifth teaching session and continued to correctly complete one or more steps without prompts during all but two teaching sessions. After 24 teaching sessions, Observational Learner B was absent from school for two weeks due to illness. His performance maintained upon his return. For the summer school session he transferred to the afternoon class where four teaching sessions were conducted. After the first of these, he completed one or more steps correctly. During teaching, the percent of sessions in which he responded correctly and independently were 71%, 37%, and 3% for steps 1, 2, and 3, respectively. This target learner did not respond correctly during probes in either the home or school setting. On one occasion he

spontaneously responded to an unsafe situation by picking up the object and putting it away.

Target Learner C

Target Learner C did not correctly complete any of the steps for responding to unsafe situations during fourteen baseline classroom probes. During two of five home probes, he completed the second step without prompts. He began to respond correctly and independently on one or more steps during the third teaching session, when the initial 3-second delay was implemented. His performance during teaching maintained at two to three correct steps during the regular school year and dropped slightly during the initial summer sessions. When a classroom staff member subsequently took over the teaching, his performance maintained as it had during the initial summer sessions. The percent of sessions in which Target Learner C correctly and independently completed steps 1, 2, and 3 were 82%, 92%, and 29%, respectively when the student researcher taught, and 40%, 100%, and 0% when a staff member taught.

After 32 teaching sessions, Target Learner C correctly completed steps 1 and 2 during a classroom probe, but did not correctly complete steps during the nine subsequent classroom probes conducted during this condition. On three occasions he spontaneously responded by completing step 1 twice and step 2 all three times.

Target Learner D

During baseline, Target Learner D completed one step without prompts during one of 19 classroom probes. After the study began his parents requested that no home probes be conducted. Target Learner D's correct responding began during the third teaching session, a 0-second delay session, in which his correct response to the

second step preceded the prompt. During all but one of the subsequent twelve teaching sessions, he correctly completed one or more steps. Target Learner D did not attend the summer session. The percent of teaching sessions during which he correctly and independently completed steps 1, 2, and 3 were 67%, 73%, and 33%, respectively. With the exception of the one baseline session, this target learner did not respond correctly during probes.

Children E, F, G, and H

The baseline data for children E-H are presented in Figures 7 and 8; these indicate that they rarely completed a step during classroom or home probes. Child E completed step 2 without prompts during one of 29 classroom probes and none during five home probes. Child F correctly completed one step (2 or 3) during three of 27 classroom probes, and one step (2) during one of six home probes. Child G completed all three steps during one of 19 classroom probes and none during the single home probe. Child H completed one step (1 or 2) during three of 17 classroom probes and none during the two home probes. The length of the school year precluded teaching with these children.

Question #2: What were the effects on an observational learner who watched at school as the multicomponent procedure was implemented with the target learner?

Data representing the observational learners' responses to unsafe situations were presented in Figures 2 and 3. Their responses to step 2 (altering the situation) were presented in Figures 4 and 5. In addition, the percent of sessions during which they correctly completed each step are shown in Figure 9.

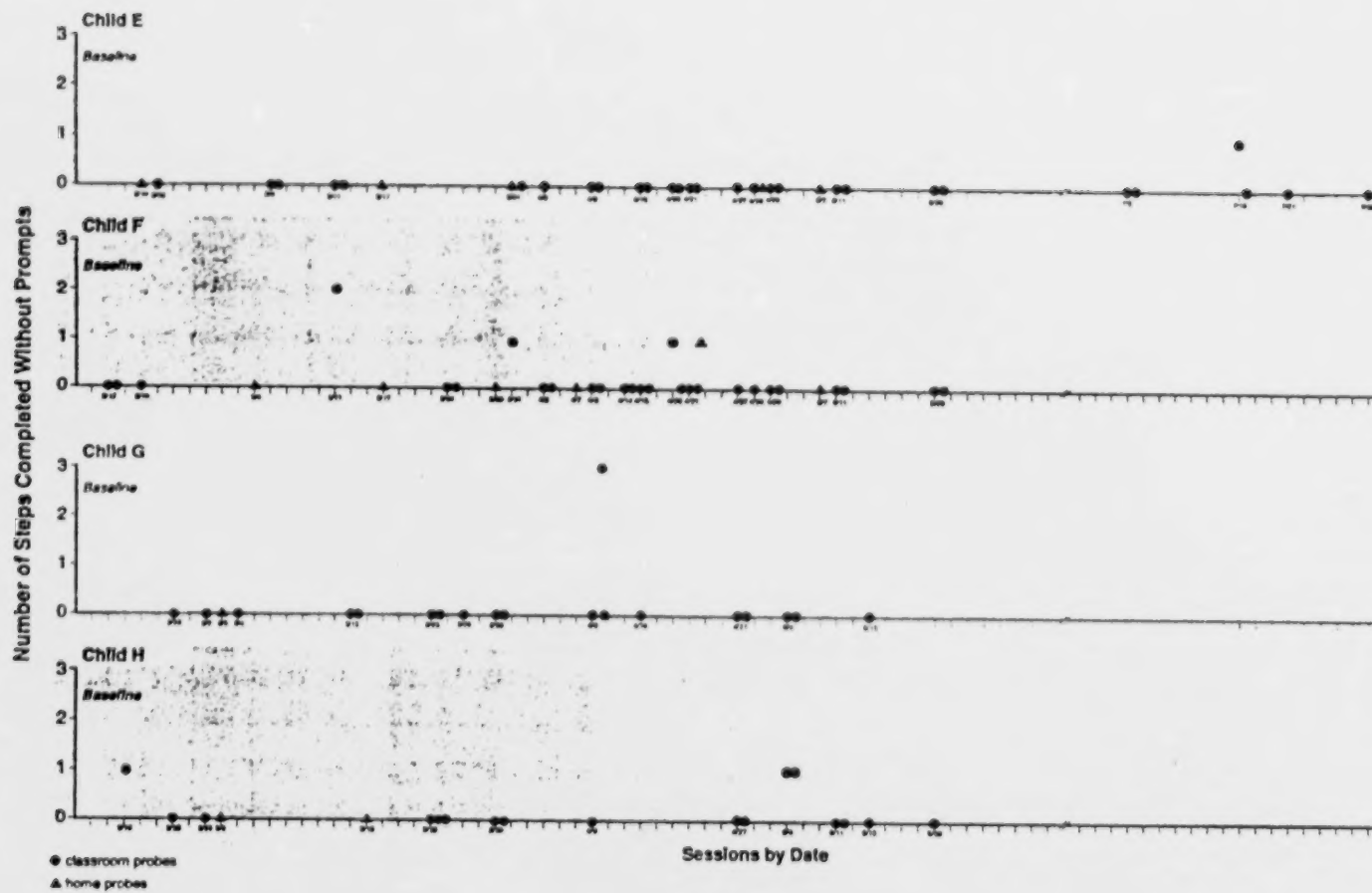


Figure 7. Responses to unsafe situations by children who were not taught.

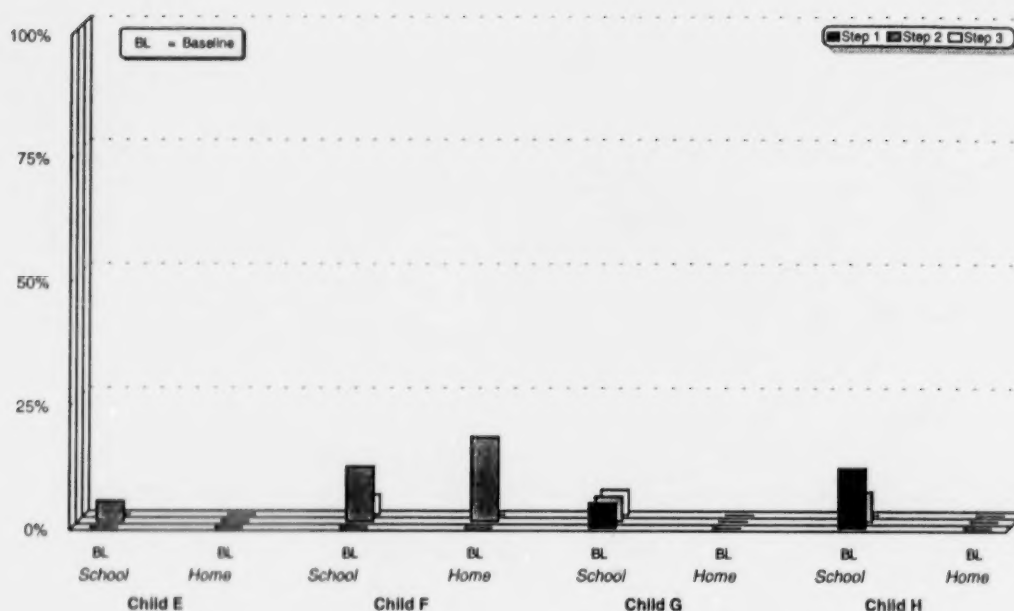


Figure 8. Percentage of probe sessions during which children who did not participate in teaching correctly completed each step.

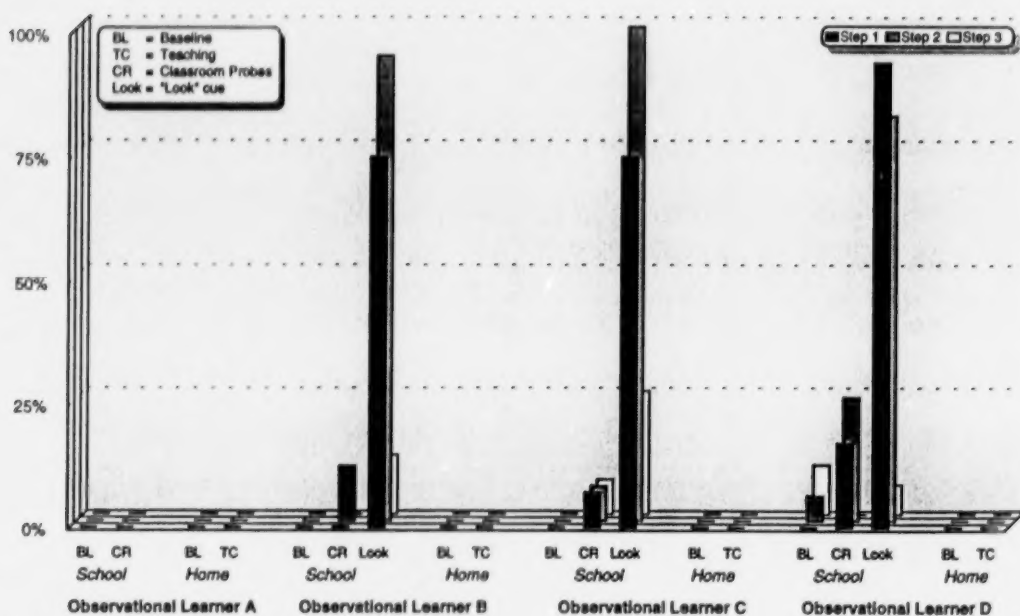


Figure 9. Percentage of sessions across settings and conditions during which observational learners correctly completed each step.

Observational Learner A

Observational Learner A did not complete any steps in any setting or condition. When she encountered an unsafe situation at home or school, she walked by or over the object(s).

Observational Learner B

During seven school and two home baseline probes, Observational Learner B did not correctly complete any steps. After teaching began with Target Learner B, Observational Learner B completed one step (step 2, altering the situation) during one of three school probes. Once during the teaching condition he spontaneously identified an object in a pathway. During teaching sessions, Observational learner B often tried to complete some of the steps for responding to unsafe situations. For example, when a backpack was placed in the doorway, he said, "I want to move it." When he said this, the student researcher told him to watch the target learner. During the first probe when the researcher gave the "look" cue, Observational Learner B asked where the target learner was; the student researcher told him he was not there, and he completed two of the steps without prompts (identify and alter the situation). During the next probe with the "look" cue, he completed all three steps without prompts and during the summer session, he continued to complete one or two of the steps without prompts each time the "look" cue was provided. This performance maintained when a classroom staff member provided the "look" cue. When the "look" cue was provided, Observational Learner B completed steps 1, 2, and 3 during 75%, 94%, and 12% of the sessions, respectively

Observational Learner C

During the 13 school and three home baseline probes, Observational Learner C did not complete any steps. After teaching began for Target Learner C, Observational Learner C completed no steps for the first four school probes conducted. However, before the fifth, he spontaneously responded to an unsafe situation completing all three steps and correctly completed all steps during the fifth school probe. He did not complete any steps during the seven subsequent school probes. During and after the eighth session when the "look" cue was provided, he always completed step 2 without prompts, also completing steps 1 and/or 3 during the last five sessions. The respective percent correctly completed in the "look" cue condition for steps 1, 2, and 3 were 75%, 100%, and 25%.

Observational Learner D

During one of the 21 classroom baseline probes, Observational Learner D correctly completed step 2 (and no other). She never responded correctly during the four home probes conducted across conditions. After teaching began with her corresponding target learner, Observational Learner D failed to respond correctly during the two classroom probes conducted prior to the summer session. When the "look" cue condition began, she correctly completed step 1 (identified the situation) for two consecutive sessions. When summer session began after the break, her performance improved to correct completion of either two or three steps during 12 of the 14 sessions. During four of the 10 classroom probes conducted during this condition, she correctly completed either one or two steps. When her responding is viewed in terms of percent of sessions in which she correctly completed each step, Observational Learner D correctly completed step 1 during 0%, 17%, and 94% of

baseline, teaching or target learner, and "look" condition sessions respectively; step 2 during 5%, 25%, and 82% of sessions, and step 3 during 10%, 0%, and 6%.

Question #3: Given an increase in the number of correctly completed steps for responding to unsafe situations for both the target and observational learners, what were the effects several weeks after teaching ended?

Since the school year and the summer sessions ended before teaching was discontinued, maintenance was not directly assessed. However, children's responses in circumstances that included variations in setting and intervenor, and after intervals when no teaching occurred suggest that the effects may have been robust. These responses are discussed by child below.

Target Learners

Following a three week break between the school year and summer session Target Learner A continued to complete 1 to 2 steps without prompts when a classroom staff member rather than the student researcher provided the teaching. This occurred even when the staff member who had provided the teaching before the school year ended had left and a new staff member provided the prompts.

Following the break, Target Learner B transferred to the afternoon class. After the first teaching session in the new classroom his performance was comparable to that in the previous classroom.

Target Learner C exhibited some decrements in performance. After the break he correctly completed one to two steps, while prior to the break he had completed two to three. No decrement in performance occurred when a staff member rather than the student researcher conducted teaching.

Target Learner D did not attend the summer session.

Observational Learners

Observational learner A did not correctly complete steps before or after the break. Observational Learner B correctly completed steps when the "look" cue was provided both before and after the break as did Observational Learner C when the cue was instituted after the break. Before the break, Observational Learner D completed one step without prompts during this condition and following the break, she completed all three steps without prompts when the "look" cue was provided. It should be noted that the target learners whom observational learners B and D had observed prior to the break were not in their classrooms during the summer sessions.

Question #4: Given an increase in the number of correctly completed steps for responding to unsafe situations at school, what were the effects on responding to unsafe situations at home and at school with other adults present?

Probe data collected at home indicate that no generalization occurred across settings. Likewise, probe data collected at school are inconclusive though some children occasionally responded correctly to probes. Data collected under varying instructional conditions (intervention by adults other than the student researcher, in different classroom settings, and when instruction consisted only of a cue to "look") bear upon the issue of generalization. This section examines those data as well as responses to classroom probes.

Responses During Variations in Instruction

Two target learners, A and C, were taught by classroom staff after meeting the mastery criterion for step 2 when taught by the student researcher. As shown in Figures 2 and 3, the responding of both generalized across instructors; they usually completed two of the three steps.

Target Learner B changed classrooms near the end of the study. His responding generalized across settings, with the student researcher serving as instructor in both.

After the target learners whom they had observed had met criterion on step 2, three observational learners were given a cue to "look" at an unsafe situation. As shown in Figures 4 and 5, Observational Learners B, C, and D responded correctly to step 2 during 81% to 100% and to step 1 during 75%-94% of the sessions in this condition.

Observational learner B had the highest overall percent of steps correctly completed across sessions when the student researcher gave the "look" cue. His responding generalized when a classroom staff member gave the cue.

Classroom Probes: Children Who Did Not Participate in Instruction

As was shown in Figure 7 and presented next in Figure 10, the responses over time of children who never received teaching indicated that children were not likely to spontaneously respond to unsafe situations. Children E and G responded only once to rectify the situation during a total of 29 and 20 respective classroom probes. Child H responded on three of 17 classroom probes, only once rectifying the situation (step 2), and Child G responded during three of 28 classroom probes by rectifying the situation.

Classroom Probes: Target Learners

Target Learner A did not respond correctly to any of the eight classroom probes during baseline. During teaching by the student researcher he responded to one of two classroom probes, correctly completing steps 1 and 2. When a classroom staff

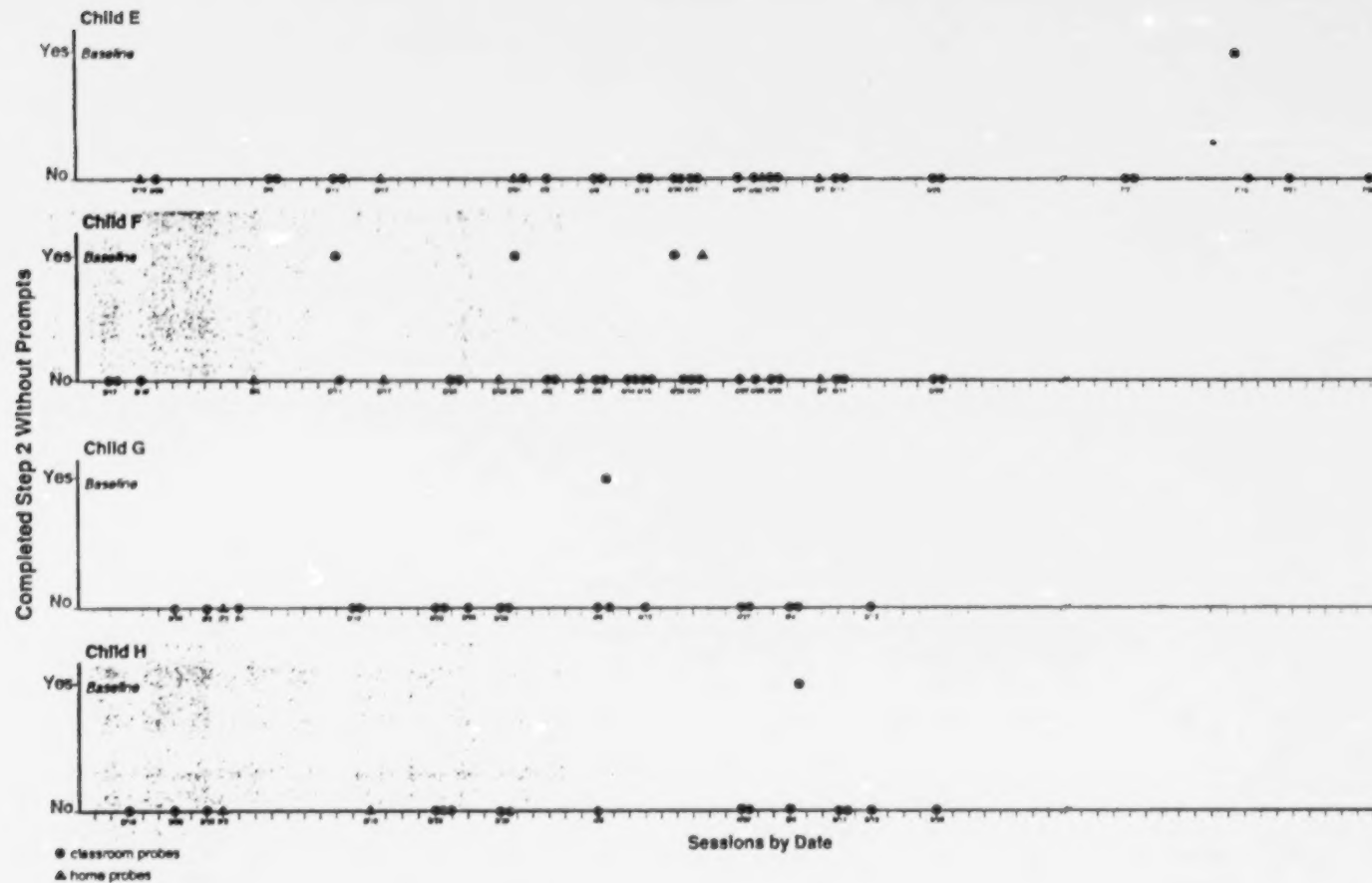


Figure 10. Completion of Step 2 (moving object from pathway and putting it away) by children who were not taught.

member provided teaching, he responded to three out of seven classroom probes, correctly completing step 1 on one, step 2 on all three, and step 3 on two. Thus, it appears that across conditions his responding was generalizing to unsafe situations encountered in the absence of instructors.

Target Learner B did not respond correctly to any of the classroom probes during any condition.

Target Learner C did not respond correctly to any of the 14 classroom probes during baseline. He responded to one of nine classroom probes by correctly completing steps 2 and 3 during the condition when the student researcher provided teaching. He did not respond correctly during one classroom probe conducted when a classroom staff member provided the teaching.

Target Learner D responded to one of 19 classroom probes by completing step 1 conducted during baseline. He did not correctly respond during two classroom probes conducted when the student researcher provided teaching.

Classroom Probes: Observational Learners

Observational Learner A did not respond correctly during any of the classroom probes in any condition (six during baseline and 15 during teaching). Observational Learner B did not respond correctly to any of the seven classroom probes during baseline. During teaching for Target Learner B, this observational learner completed step 2 one of three classroom probes. Once he spontaneously responded correctly to an unsafe situation that was not intentionally set up by identifying the situation. During the "look" cue condition, Observational Learner B did not respond correctly to any of six classroom probes.

During baseline, Observational Learner D responded correctly to one classroom probe by completing step 2. She did not respond correctly during two classroom probes conducted when she watched the student researcher provide teaching for Target Learner D. When the student researcher provided the "look" cue, she correctly responded to four of ten classroom probes by completing step 1 on two and step 2 on three probes. Thus, it appears that Observational Learner D's responding was starting to generalize to unsafe situations in the absence of the student researcher.

Question #5: Could the multicomponent intervention be implemented reliably within the daily routines of the classroom?

Half of the teaching sessions were scored by one of the data collectors for the percent of components implemented correctly. Another data collector independently scored 27% of those teaching sessions for reliability. Praise statements following participants' responses were recorded for all probe and teaching sessions. Results that address this question are reported as follows: (a) reliability regarding components implemented correctly, (b) percent of teaching components implemented correctly, and (c) praise statements following children's responses.

Reliability of Measurement of Correctly Implemented Components

Table 9 shows for each target learner the percent of teaching sessions scored and the mean and range in percent of interobserver agreement. For all teaching sessions scored for reliability, the overall mean percent of interobserver agreement was 93% (range 83-100%).

Correct Implementation of Teaching Components (Treatment Fidelity)

The means and ranges for percent of correctly implemented teaching components are presented in Table 10 for each target learner. Half of the teaching

Table 9

Interobserver Agreement (IOA) about Correct Implementation of Teaching Procedure
for each Target Learner

Target learner	Teaching sessions scored	Mean percent of IOA	Range
A	26%	93	83-100
B	33%	95	87-100
C	25%	93	88-100
D	25%	94	87-100
Overall	27%	93	83-100

Table 10

Treatment Fidelity for each Target Learner Expressed as Percent of Correctly
Implemented Components

Target Learner	Teaching Sessions Scored	Correct Components Mean Percent	Range
A	51%	97	83-100
B	44%	98	93-100
C	51%	95	77-100
D	53%	98	93-100
Overall	50%	97	77-100

sessions were scored for components implemented correctly. Correctly implemented teaching components ranged from 77-100% with a mean of 97%.

Praise

Following each participant's response for each step, praise statements were scored if they were provided. Different adults could have provided praise statements

for step 3. During teaching sessions, the adult (student researcher or staff member) should have praised each correct response. Ideally during probes, the adult to whom the child reported would have praised a child's correct response for step 3 and might also have praised responses on steps 1 and 2 if she observed it. Table 11 shows the number and percent correct responses followed by praise. Columns differentiate the adult who might have provided praise. Overall, the student researcher provided praise following 96% of children's correct responses. Classroom staff members provided praise following 79% of children's correct responses. Praise rarely followed correct probe responses.

Social Validity

The four participating teachers and nine of the ten parents whose children participated in the study completed questions about the study. Questionnaires were not sent to the parents of children G and H. Child G's family moved prior to the end of

Table 11

Number and Percent of Children's Correct Responses Followed by Praise and Adult Who was Expected to Provide Praise

Step	Teaching Sessions by Student Researcher	Teaching Sessions by Staff Member	Classroom Probes	Home Probes
1	94% 159/170 Student Researcher	95% 19/20 Staff Member	0% 0/4 Staff Member	50% 1/2 Parent
2	98% 172/175 Student Researcher	61% 22/36 Staff Member	33% 7/21 Staff Member	25% 1/4 Parent
3	89% 123/138 Staff Member	97% 28/29 Staff Member	50% 3/6 Staff Member	NA 0/0 Parent

the school year and approximately half way through the study Child H's parent requested that we discontinue home probes. The parent of Target Learner D did not return the form and moved out of state at the end of the school year. Responses to items on the questionnaire are summarized in Tables 12 and 13. Parents and teachers responses to the question, "How did you feel about having this study conducted in your classroom?" or "How did you feel about your child participating in this study?" are included in Appendix K.

Ancillary Measures

Parents returned only three logs describing children's responses to unsafe situations throughout the study. Each log described one or two incidents that occurred at home. Two involved objects on the floor. Once a child tripped and scraped her elbow and a boy stepped on a truck and cut his foot. At times throughout the study teachers and parents reported an incident that they observed, yet they did not write

Table 12

Parents' Responses to Questionnaire (n = 9)

Question	Response		
	Mean	Mode	Range
1. Move objects or materials left where people are likely to trip on them	4.44	5	3-5
2. Tell an adult if they move objects or materials so people will not trip on them	4.22	5	3-5
3. Tell you if there are objects or materials in pathways before he/she puts them away	3.86	3.5	3-5
4. If somebody showed you how to teach your child to identify and correct unsafe situations, would you want to teach your child to do this at home?	4.44	5	3-5

Note: 1 = not important or not at all; 5 = very important or yes, definitely

Table 13

Teachers' Responses to Questionnaire (n = 4)

Item on questionnaire	Response		
	Mean	Mode	Range
1. Move objects or materials left where people are likely to trip on them	4.25	4	4-5
2. Tell an adult if they move objects or materials so people will not trip on them	2.75	2	2-4
3. Tell you if there are objects or materials in pathways before he/she puts them away	3.25	4	2-4
4. The procedure used could be easily implemented within the daily routines of my classroom.	3.50	4	2-4
5. I would use the procedures to teach safety related skills to the children in my class.	3.75	4	2-4
6. I would use the procedures to teach other skills	2.75	3	2-3

Note: 1 = not important or not at all; 5 = very important or yes, definitely

them down on the logs. For example, at school, one of the participants tripped over an object and cut his lip. None of these incidents were related to probes or teaching sessions. Data collectors who conducted home probes frequently reported observing children tripping over objects (not intentionally set up for a probe) while they were in the homes. Sometimes they wrote descriptions on the data sheet when they observed these situations.

CHAPTER IV

DISCUSSION

The purpose of this study was to examine the direct and observational learning effects of a multicomponent teaching procedure on the acquisition, generalization, and maintenance of preventive safety skills in preschool children with disabilities. The student researcher taught four target learners to respond to unsafe situations. Observational learners who were paired to each of the target learners watched during teaching sessions. Target and observational learners' responses were measured during classroom and home probes throughout the study. All four target learners correctly completed more preventive steps during teaching than baseline sessions. Two continued to complete the steps when a staff member provided teaching and also correctly responded during classroom probes when the student researcher was not present. Initially, observational learners did not respond to classroom probes after watching the target learner during teaching sessions. When a "look" cue was provided, three of the observational learners correctly responded to unsafe situations. None of the learners consistently responded to unsafe situations set up during home probes before or after the teaching that occurred at school.

This chapter addresses the (a) major conclusions drawn from the results of this study, (b) limitations of this study and (c) implications for future research.

Major Conclusions

The major conclusions of this study address the following: (a) target and observational learners' responses to unsafe situations as a result of teaching, (b) generalization of skills to the home setting, (c) evidence of maintenance, (d) reliable

implementation of teaching procedure, and (e) parents' and teachers' responses to the research. Each of the conclusions is discussed below.

Target Learners' Responses During Teaching

Although all four target learners responded correctly during teaching, only two responded correctly during classroom probes or spontaneously responded to situations not intentionally set up, and then only after a staff member provided the teaching. Two target learners did not respond correctly during classroom probes and did not participate in the condition where a staff member provided the teaching. It is not known if they would also have started to respond during classroom probes if this condition had been implemented. It appeared that initially the student researcher who provided the teaching was the discriminative stimulus for engaging in the response to an unsafe situation. Several steps were taken to transfer stimulus control from the student researcher to the unsafe situation itself. First, the student researcher taught a classroom staff member to implement the multicomponent procedure with the target learner only. Only during the first teaching session conducted by the classroom staff member was the student researcher present, and she was on the other side of the room observing the teaching session. Subsequently, the classroom staff member conducted teaching sessions in the student researcher's absence. During this condition, the only difference between classroom probes and teaching sessions was whether the classroom staff member provided teaching. Transfer of stimulus control was evident when the target learner correctly responded to unsafe situations during classroom probes or spontaneously responded to unsafe situations when the student researcher was not present.

The hypothesis that the student researcher served as a discriminative stimulus for responding to unsafe situations is supported in the literature. Other studies have identified the issue of persons involved in training serving as cues for specific target responses as a possible limitation. For example, when Christensen et al. (1996) taught preschoolers to seek adult assistance when injured, one child responded correctly only in the presence of the instructor. After another adult provided praise for correct responses this child began to respond correctly. Gast et al. (1993) taught preschoolers to respond to the lures of strangers. A trainer implemented a time delay procedure in simulated classroom sessions. The children rapidly met criterion during these simulated training sessions, yet did not generalize these skills to probes conducted in the community until training was conducted during these sessions. In this study, it was possible that the trainer served as the discriminative stimulus for the child to respond to unsafe situations.

If the adult who implements the teaching procedure is one the child sees in everyday situations not limited to specific teaching sessions, the child may be more likely to complete the steps during classroom probes than in this study when the student researcher was present in the classrooms only after the teaching condition was implemented. During the teaching condition, she spent an hour to an hour and a half in the children's classroom and implemented one to three teaching sessions during times the target learner was likely to encounter an unsafe situation. Even though she interacted with other children in the classroom and participated in ongoing classroom activities, some of the learners in this study associated the student researcher with the teaching procedure. For example, when the student researcher arrived, Observational Learner C frequently ran up and said, "Let's go see what (Target Learner C's name) just did" or "Let's watch (Target Learner C)" and on one

occasion, he went over and pointed to a stuffed animal on the floor and said, "Look what (Target Learner C's name) did."

A variable that may have contributed to children's relatively poor performance during classroom probes (as opposed to teaching) may have been the inconsistent consequences. Praise was contingent upon correct completion of each step during teaching. Praise was considered to be a natural consequence insofar as it was likely provided contingent on other correct responses throughout the day. However, praise rarely followed a child's correct response for any step during classroom probes. In fact during probes, staff members rarely praised the child after he or she completed the third step, reporting that he/she rectified the unsafe situation. Instead, some staff members redirected the child to complete a task or begin an activity. This lack of praise suggests that staff members may not be likely to teach or reinforce the safety skills taught during daily transitions or that they did not consider reporting to be important.

Observational Learners' Responses to Unsafe Situations

Initially, none of the observational learners responded to unsafe situations after watching the student researcher implement the teaching procedure with the target learner. At the end of each teaching session the student researcher asked the observational learner, "what did (target learner's name) just do?" Three observational learners consistently responded with appropriate answers such as, "He put the book away," "He fixed the rug," and "He picked up the blocks and put them over there." The three observational learners who did respond to the question also responded in other ways during teaching sessions. Observational Learner B often tried to complete the steps himself, stated he wanted to complete a step (i.e., "I want to do it"), or made

statements about what the target learner was doing (i.e., "He's putting it away"). Observational Learner C frequently made statements to the student researcher about watching the target learner (i.e., "Let's go see what (target learner's name) just did," "Watch (target learner's name)," "Do you know what (target learner's name) just did?"). Furthermore, Observational Learner C's responses to the question "What did target learner's name just do?" became more detailed as the study progressed. For example, during the initial teaching sessions his responses included the object and a verb (i.e., "He put the books away"). As teaching continued his responses expanded to include a safety-related component (i.e., "He picked up the blanket so nobody will fall").

During some teaching sessions with Target Learner D, Observational Learner D asked, "Why do I always have to watch (target learner's name)?" Thus, Observational Learner D may have not realized she was expected to do the same responses she watched Target Learner D do when she saw a similar situation. When the "look" cue was provided, Observational Learner D identified the situation and on subsequent sessions correctly completed additional steps.

The first time that the student researcher provided the "look" cue, each of the three observational learners looked around as if he or she was looking for the target learner. In fact, Observational Learner B asked, "Where's (target learner's name)?" The student researcher said, "He's not here" and Observational Learner B then identified the situation and put away the object. On subsequent sessions with the "look" cue he often made verbal statements about what he was doing. For example, he said, "watch me," or "I'm going to put the coat away."

If the procedures used in this study were to be effective, observational learners would have to respond to the discriminative stimulus when it is present. In this study

the discriminative stimulus was the unsafe situation. When the "look" cue was provided observational learners were more likely to respond to unsafe situations. Whitehurst (1978) suggested that the observer should be told prior to watching a model perform a skill that he would perform it at a later point in time. In this study, during the teaching procedure observers were taught to watch and not complete any of the steps themselves. No cues or instructions were provided for them in terms of what to do when they encountered an unsafe situation when the target learner was not present. Verbal cues or instructions (e.g., "When you see toys in the doorway, do what (target learner's name) did") might have increased the likelihood that the observational learner might respond correctly when she encountered unsafe situations during classroom probes.

Observational Learner A never responded to the question, "What did (Target Learner's name) just do?" She looked at the student researcher for awhile and then walked away. As she never said anything during teaching sessions, it is difficult to draw conclusions regarding her responses to unsafe situations throughout the study. Furthermore, Observational Learner A did not often respond to direct requests given by staff members. Observational learners in this study were asked to give a verbal response to the question, "What did _____ just do?" If the observational learner did not respond, no additional prompts were provided. All of the other children in this study responded to direct requests whether provided by the student researcher or classroom staff members. One factor that promotes observational learning is that the child should be able to complete skills in other situations rather than expecting a child to learn a new skill that he has never performed before (Browder et al., 1986-87). Perhaps responding to direct requests is a prerequisite skill if learners are to benefit from the type of teaching procedure used in this study.

Lack of Generalization of Responses to Home

Data regarding generalization of responses to home probes are limited because few home probes were conducted during the later conditions of this study. Target and observational learners did not consistently respond correctly to unsafe situations at home even after they responded during classroom probes. One variable that may contribute to the lack of generalization of these responses to home is that the discriminative stimulus (unsafe situation) might have been more obvious in some homes than in others. There are many physical differences between the school and home settings, as well as between homes. For example, some children's homes were very neat with few objects that appeared out of place. However in other homes there were many objects on the floor and data collectors had difficulty trying to set up a probe since there were so many "situations" already set up. On the other hand, unsafe situations sometimes appeared to be obvious at school because the object was out of place. In fact, on occasion classroom staff members would pick up the objects the data collectors had just set up before the child encountered the situation.

Previous studies that addressed teaching skills to young children with disabilities have shown mixed results in terms of generalization of newly acquired skills to other settings and situations (see Chandler, Lubeck, & Fowler, 1992). For example, Cast et al. (1993) taught preschool aged children with disabilities appropriate responses to the lures of strangers, however, children did not generalize these responses to community situations until teaching was conducted during those situations. Stokes and Bear (1977) discuss the importance of generalization when teaching new skills to individuals with disabilities. They suggest several procedures that if incorporated into the teaching procedures may increase the likelihood that newly acquired skills will generalize to untrained situations. These include using (a) natural contingencies, (b)

sufficient exemplars, (c) common stimuli, (d) indiscriminable contingencies, and (e) to train loosely. Stokes and Osnes (1989) expanded on these components by describing twelve specific practices within the following three categories: (a) exploit current functional contingencies, (b) train diversely, and (c) incorporate functional mediators. This study incorporated many of these practices. First, under the category of exploit current functional contingencies, natural contingencies were contemplated. Target learners were taught to tell an adult what they did after altering an unsafe situation because adults might praise learners for completing this step. Stokes and Osnes (1989) refer to this as recruitment of natural contingencies because the child actively sought out the adult's attention. When learners reported what they did to a staff member, staff members usually provided praise. Second, adults were asked to reinforce any occurrence of generalization. When learners responded to unsafe situations not intentionally set up or set up during classroom probes, adults were told to praise the learner for the steps that he completed. (Note, the only occurrences of spontaneous responses were recorded when a data collector was present.) During classroom probes and spontaneous responses, staff members were less likely to praise the learner's correct responses. As adults did not consistently use the accident/injury logs or keep track of information such as what the learners did or said about unsafe situations, there is no way to know what happened when data collectors were not present.

Third, under the category of train diversely, this study used multiple stimulus exemplars and response exemplars. Many different stimuli were used in the unsafe situations. A variety of objects and locations were used in two different settings. Learners could respond in different ways, the most common of which was to put an object away. Learners could also move the object to a safer place that was not its

correct place, or ask someone else to move the object. Fourth, consequences may have been less discriminable since praise was provided on an intermittent reinforcement schedule. Thus, learners did not always receive praise when they correctly completed the steps, especially following the third step and during classroom probes. Finally, this study incorporated functional mediators (which was the third category described by Stokes & Osnes, 1989) by using common stimuli that were present in both settings. For example, learners' backpacks were used at school and at home. In spite of using some of these practices, generalization of completing the steps for responding to unsafe situations from classroom to home setting did not occur.

One way to increase generalization of responses to home might be incorporate the use of a matrix model (Goldstein & Moussetis, 1989; Kaczmarek, 1990; Kaczmarek, Hepting, & Dzubak, 1996). A matrix model allows systematic selection of stimuli to be taught by teaching one set of stimuli at a time while testing for generalization to new stimuli or situations. Goldstein and Moussetis (1989) define matrix training procedures (also called recombinative generalization) as

the process of producing or responding to novel utterances; when familiar stimuli are recombined in novel ways, stimulus elements continue to exert precise and appropriate control over corresponding portions of the novel responses. (p. 246)

This study did not teach new utterances but taught children how to respond to unsafe situations that contained a variety of objects in various locations. Using a matrix model, one object in a location might be taught at one time. In this study it appeared that the student researcher served as a discriminative stimulus for responding to unsafe situations. Therefore, variables that may act as a discriminative stimulus for responding to unsafe situations may include the object, location, person(s) present

(specifically the adult who implements the teaching procedure), and setting (classroom and home). By systematically teaching to specific unsafe situations, using a matrix to examine the range of possibilities for unsafe situations, a closer analysis of generalization of responding to unsafe situations across stimuli, settings, and people is possible. An example of how a matrix might be set up using the situations used in this study is presented in Table 14. If specific situations were taught in the classroom, probes might be conducted in the absence of the adult who implemented the teaching procedure and in the home settings using the same situations that were taught in the classroom.

Maintenance Over Time

Children responded at similar levels before and after lapses of time between teaching sessions and in the presence of different instructors and procedural variations across instructors (i.e., staff member provided teaching). Since the school sessions ended before teaching was discontinued it is not known whether children would have continued to respond at similar levels after a period of time when no

Table 14

An Example of a Matrix Model to Teach Appropriate Responses to Specific Objectives and Locations of Unsafe Situations

Objects	Hallway	Doorway to outside	Doorway to bathroom	Floor in front of sink
Backpack	Teach first			
Books		Teach second		
Trash			Teach third	
Toy cars				Teach fourth
			Teach third	Teach fourth

teaching occurred. Based on the data presented in this study, it is likely that the learners would continue to respond similarly over time because learners' responses were similar before and after the three week break between the end of the school year and the summer session. However, additional data is needed for verification.

Reliable Implementation of Teaching Procedure

The student researcher reliably implemented the teaching procedure within the daily routines of each classroom. Other staff members introduced variations into the teaching procedure. Specifically, when a staff member provided teaching, only the target learner was present; therefore, cues to the observational learner were not provided.

During teaching, staff members usually praised each step, however, during probes, when children completed steps, they did not often praise responses. If natural consequences are expected to maintain a child's response to unsafe situations, and praise is not provided when he correctly responds, then praise is not a reliable natural consequence. Staff members may need to be taught to provide praise following correct child responses, or other positive consequences may need to be identified if children are expected to continue altering unsafe situations.

Parents' and Teachers' Responses to Items on Questionnaire

Parents' and teachers' responses on the social validity questionnaire indicated that they thought the first two steps (identify and alter situation) were more important than the third step (telling someone). These results may explain why praise was not always provided following completion of the third step. In fact, all learners were less likely to complete the third step than the first or second steps. If staff members did not

praise correct responses for the third step, children may not be likely to complete that step in the future, especially if correct responses were followed by a staff member redirecting the child to an activity or to complete a task. On the other hand, completion of the third step may not be associated with completing the first two steps. If a learner consistently completed steps 1 and 2 and correct responses were followed by praise on an intermittent schedule, then the third step may not be necessary or related with completion of the first two steps.

Teachers' responses to item 6 (likely to use procedure to teach other skills) were low, indicating that they would not likely use the procedure implemented in this study. One of the teachers completed the questionnaire prior to this part of the study and the other teacher after. It is not clear how familiar the teachers were with the procedure used in this study. Many of the teachers observed the student researcher implementing the procedure; however, it was not described in detail and they were asked not to directly teach learners to respond to the unsafe situations used in this study. For target learners that received teaching by a staff member (A and C) the teachers were asked if they wanted to implement the procedure or to suggest a staff member who was present everyday. Both teachers suggested another staff member. None of the teachers actually implemented the procedure, which may indicate that they did not know enough about the procedure to decide if they wanted to take the time to learn it or considered it was important or especially useful for them.

Limitations

There are several limitations of this study. First, results and conclusions are restricted to the unsafe situations used in this study, specifically objects left in high traffic areas where someone is likely to trip. Other unsafe situations that children are

likely to encounter frequently (i.e., water or ice on the floor, sharp objects within child's reach, etc.) were not included in this study so it is not known if young children with disabilities can be taught to identify and/or alter other situations.

Second, the lack of home probes conducted after teaching and other conditions (staff member provided teaching and "look" cue) were implemented make it difficult to know whether learners would have generalized responding to unsafe situations to their home settings. The target learners might have responded during home probes as the study continued since some generalization of responding to classroom probes occurred when the student researcher was not present after the implementation of the condition when the staff member providing teaching. The observational learners might have generalized their responses to unsafe situations to home after the condition with the "look" cue was implemented because they responded to unsafe situations in the classroom without additional teaching. During the summer session it was not possible to send data collectors to children's home because only one data collector was available. It is possible that the children might have started responding to unsafe situations at home after they were correctly completing the steps during classroom probes and during other conditions (staff member teaching or "look" cue), which occurred during the summer session.

Third, there was no "look" cue provided during baseline for any of the learners. Occasionally during probes it was not clear whether the child saw the object. During sessions when the "look" cue was provided, the child was cued to look at the object. If a "look" cue was provided during baseline conditions, it is possible that a child might have correctly completed one or more steps. However, this is not likely since during many baseline probes it was clear that the child saw the object because he walked carefully around the object, stepped over the object or even jumped on it.

Fourth, as with all studies that use multicomponent teaching procedures, the results are limited to the multicomponent teaching procedure used. The procedure included time delay, verbal and physical prompts, attentional cues and praise for correct responses. Altering the procedure in terms of adding or deleting any of the components may or may not result in better outcomes.

Implications for Future Research

The results of this study suggest that the procedure used is effective in teaching young children with disabilities to respond to some types of unsafe situations in the classroom. Further research needs to address stimulus control such as, teaching young children to discriminate their responses to variables present in the unsafe situation itself rather than to a person. There are several alterations in the teaching procedure that are worth investigating. First, classroom staff members who are present everyday could implement the procedure. Thus, the learners might be less likely to associate that staff member with the unsafe situation and only respond when that staff member is present. Second, a matrix model might be useful for systematically teaching specific situations while probing for generalization in other situations. This approach would allow a more thorough analysis of the generalization of newly acquired skills to new stimuli, settings, and people. Third, additional cues given to the observational learner before or after she watches the target learner model correct responses might encourage the observational learner to respond to unsafe situations when the target learner is not present.

The teaching procedure might also be useful when teaching young children with disabilities to respond to other types of unsafe situations. Researchers have identified several types of unsafe situations that preschool aged children with disabilities

frequently encounter. These include care on wet floors, safe use of playground equipment, and correct use of seat belts (Collins et al., 1991; Huber et al., 1996).

The validity of studies that examine teaching preventive safety skills should always be examined. Ideally studies should be conducted that link teaching preventive safety skills with a decrease in the number of actual accidents and injuries. This is a very difficult task since frequently encountered situations do not always cause accidents or injuries and it is difficult to monitor how often a child encounters a situation and the specific cause of all accidental injuries.

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APPENDICES

Appendix A
Parent Consent Form

March 10, 1998

Dear Parents,

We want to study a method to teach preschool aged children safety skills to prevent accidents or injuries. The children will participate either by being directly taught or by watching others. The teaching procedure consists of using verbal and physical help to teach the child to: (a) identify an unsafe situation, (b) change the situation to make it more safe, and then (c) let someone else know that the problem is resolved.

If you would like your child to participate in this study, we need your consent. Information obtained will be confidential; real names will not appear in any report. This study will not in any way affect your child's class standing. At least two adults will supervise each session to prevent accidents as children learn to alter unsafe situations.

We would like to videotape some of the teaching sessions. Videotaped segments will be used by observers to code information. We would like to show some of the videotaped segments to other professionals on campus and at regional and national conferences. It is not necessary to videotape all teaching sessions or show all videotaped sessions at conferences. If you do not want your child to be videotaped or the videotaped sessions shown at conferences it will not affect your child's participation in the study. We would appreciate your permission for your child to participate in this study. You may withdraw your permission at any time. A permission slip is attached below. If you have any further questions, please contact us. Thank you for considering this request.

Sincerely,

Sarah Rule, Ph.D.
Associate Director
Center for Persons with Disabilities
797-1987

Marion Tso, M.Ed.
Graduate Student
797-2017

My child may participate in the study on teaching safety skills to prevent accidents or injuries. I understand that teaching sessions will be videotaped and only be used for observers to code information and shown at conferences if I circle yes below. I understand all records will remain confidential. I also understand that participation in this study will not affect my child's class standing, and that I may withdraw my consent at anytime without consequences for my child.

Child's Name: _____ Date: _____ Phone Number: _____

Signature of Parent/Guardian: _____

Please circle yes or no if your child may be videotaped during this study: Yes No
Please circle yes or no if videotaped sessions may be shown at conferences: Yes No

Appendix B
Assessment Form

Assessment

Child: _____ Date: _____

Person conducting assessment: _____

Imitation

Directions:

- At the beginning of each component, state the initial instructions.
- For each item in the assessment, state the appropriate cue and allow 5 seconds to respond.
- If no response occurs within 5 seconds, repeat the cue one time and allow 5 more seconds to respond before continuing to the next item.
- Circle the Y beside the item for correct imitations within 5 seconds following the cue(s).
- Circle the N beside the item for no response or incorrect imitations within 5 seconds following the cue(s).

VERBAL

Initial Instructions:

"I want you to say what I say."

Cue:

"Say (word) ."

WORDS

1. dog	Y	N
2. ball	Y	N
3. hand	Y	N
4. red	Y	N
5. baby	Y	N
6. car	Y	N
7. door	Y	N
8. head	Y	N
9. walk	Y	N
10. fast	Y	N

of correct imitations: _____

MOTOR

Initial Instructions:

"I want you to do what I do."

Cue:

"Do this (action) ."

ACTIONS

1. touch head	Y	N
2. sit on floor	Y	N
3. pat legs	Y	N
4. stand up	Y	N
5. shake head	Y	N
6. clap hands	Y	N
7. walk around object	Y	N
8. raise hands	Y	N
9. pick up object	Y	N
10. cover mouth	Y	N

of correct imitations: _____

Christensen (1994)

Communication Skills

Record what child says after the following direction:

Point to group interaction in progress and ask, "What is going on over there?"

Ask child to complete simple task (i.e, put book away) and say, "Go tell your teacher what you just did."

Ask child to watch classmate and then ask, "What did (classmate's name) just do?"

Transitions

Observe if the child moves from one activity to another without any help.

Comments: _____

Appendix C
Response Definitions and Data Collection Procedures

Response Definitions and Data Collection Procedures

Responding to an Unsafe Situation

Record the information in the blanks provided at the top of the data sheet prior to the beginning of the probe or teaching session.

STEPS:

1. Verbal description of situation: Within 3 sec of encountering the unsafe situation, the child verbally (or signs) something about the unsafe situation to an adult (e.g., "oh, there's a ball in the doorway and someone might fall"). Verbal descriptions need to include a referent to the object and the location of where the object is placed as well as a referent to safety ("someone might fall").

Score a PC (partial correct) if the verbal description contains only the object or the location label, score as a partial correct "PC" and write "O" if the object label was stated, "L" if the location was stated, or "OL" if both were stated and there was not a referent to safety. Score "S" if a referent to safety was given. Verbal descriptions include questions (e.g., "Who left these skates here?").

- Nonverbal response of pointing: If child points to object score an L for location and write in comments section child pointed to object.
- Only score O, L, or S for child's initial response.

2. Does something to alter situation to make it safer: Within 3 sec of step #1, the child does something to make the situation safer (e.g., independently moves object to a safer place, puts object in the correct place, gives object to someone else, asks someone for help). Write a brief description of what the child did (e.g., put blocks away, gave blocks to teacher, etc.)

Score a PC (partial correct) if the child's initial response is to do part, but not all of the response as described above. Examples include if the child picks up the object or moves the object but does not put it in the correct place.

3. Tells someone what she did: The child tells an adult what she did within 3 sec of completing step #2 (e.g., "I moved the ball", "no more toys on the stairs").

Score (O, L, S) for what child says to an adult (similar to step 1).

Score a PC (partial correct) if the child does part (but not all) of the response as defined above. Example is looking for the teacher and can't find her.

If the child does not complete the steps for responding to an unsafe situation, write down what the child does when he/she encounters the (i.e., walks past situation, plays with objects, kicks object, etc.)

Record the steps as defined above using the following codes:

+ Correct response before any prompts	Child completes response correctly without any help Response includes referents to object, location, and someone might fall.
+pc Partial Correct	Child completes part of a correct response (but not all) before any prompts
+P Correct response after first prompt	First prompt for each step: 1. "What's wrong?" 2. "You need to move it" 3. "Tell mom/dad/teacher what you did"
- Incorrect response before any prompts	Child does something other than what is described in definition (i.e, plays with object, walks over object and continues to complete a task, kicks object, etc.)
-P Incorrect response after first prompt	Child does not make correct response after first prompt and adult needs to continue providing help.
NR No response	Child stops when he encounters situation and waits.
-	Score +p if child responds correctly after first prompt (even if first prompt was not "what's wrong?"). Score -p if child does not respond correctly after first prompt. Ignore if there are additional prompts.

In order to decide if one or two prompts have occurred:

One prompt if within verbal stream. Example, Say "there's blocks on the floor, someone might fall, What's wrong?"

Two prompts if child responds incorrectly after first prompt or there are at least 3 sec of no child response between prompts.

Example:

C: "blocks"

A: "Yes, there's blocks on the floor and someone might fall, what's wrong?" (1st prompt)

C: "Blocks on floor" (OR no response for at least 3 sec)

A: "Say, there's blocks on the floor, someone might fall" (2nd prompt)

- C: Says nothing and starts to pick up puzzle
 A: "What's wrong? Say, There's a puzzle on the floor and someone might fall" (1st prompt)
 C: Says nothing for at least 3 sec.
 A: "Say there's a puzzle on the floor and someone might fall" (2nd prompt)

Praise from others

Positive behavior specific statements provided by an adult during or after the completion of any of the step(s) for responding to an unsafe situation (e.g., "Thanks for telling me what you did", "I like the way you moved the ball"). Behavior specific praise needs to be contingent and contain a verbal referent to completing the step(s) in the sequence. Praise related to following the initial instruction will not be recorded (i.e., "Thanks for bringing me this" after the child responds to "Get me the lotion in the bathroom"). Praise given that is not behavior specific will be scored as a "+g".

For each step, score a "+s", "+g", or a "-" in the praise column of the data sheet. A "+s" is scored if behavior specific praise is provided according to the definition of praise. A "-" is scored if no praise is provided before the next step begins. If praise is given that is not behavior specific (e.g., "good", "nice job", etc.), score a "+g".

- Praise for the last step (tell someone what you did), score if praise was provided by any adult: This includes the teacher/mom/dad.

During Intervention sessions

Write down the OL's response when asked, "what did _____ just do?"

Write down what the OL does during the intervention session. For example, if he tries to pick up the object or talks about the object, write down what he did and/or what he said in the spaces labelled, "Comments about OL".

Intervention Procedures

PROVIDE CORRECT AMOUNT OF DELAY:

For 0 sec delay:

Score "+" if there is no delay between the previous step and the next step. If there is a delay, score "-".

For 3 sec delay:

Score "+" if there is a 3 sec delay between the previous step and the next step. Score a "-" if there is no delay or a delay longer than 3 sec.

The delay begins immediately after the previous step (which is praise or the TL encountering the situation) and ends when the TL begins to respond or the adult gives a prompt.

PROMPTS:

For the first step in the sequence: If the TL says less than a full correct (i.e., "a backpack") then the adult should confirm the child's response, give verbal model and say, "what's wrong?" (i.e., "yes, there's a backpack on the floor someone might fall, what's wrong?")

NA should be scored if a step was not applicable. This applies to the prompts and the last step. If the child makes a correct response then the next prompt (for that response) should be scored as NA. If the child does not say anything when asked "what did _____ just do?", then score NA for provides neutral response "thanks for telling me."

PRAISE:

Praise needs to be behavior specific in order to be scored as a "+"

ATTENTIONAL CUES:

Use the following code to score attentional cues:

- +c OL not attending and adult gives cue
- + OL attending and adult did not give cue
- c OL attending and adult gives cue
- OL not attending and adult did not give cue

If you cannot tell if the OL was attending, write cannot tell and indicate if a cue was given or if the cue was not given.

Appendix D

Data Collection Form for Responding to Unsafe Situations

Data Collection Form for Responding to Unsafe Situations

Child's Name: _____ Date: _____ Time: _____
 Situation: _____
 Condition: _____ Data Collector: _____ Reliability: Yes No
 Delay: _____

Step	+(c)	+(pc)	+P	-	-P	NR	Praise	Other Comments	Comments about OL
Verbal description		O =object only L = location only S = Safety							
Alters situation									
Tells someone what she/he did									

+ = Correct before the prompt
 +P = Correct after the prompt
 - = Incorrect before the prompt
 - = Incorrect after the prompt
 - = Incorrect after the prompt
 NR = No response

OL's Response to "What did _____ just do?"

If the child did not complete the steps, what did she do when she encountered the situation? _____

Appendix E

Checklist for Implementation of Intervention Procedure

Checklist for Implementation of Intervention Procedure

Date: _____ Target Learner: _____
 Situation: _____ Delay: _____

Circle a plus (+) for each component completed during the teaching session. Circle a minus (-) if the component was not completed or it was completed incorrectly. If a component was not implemented because it was not necessary (i.e., no prompt because TL completed step independently), then circle NA. Circle "P" for each occurrence of praise directed to OL for attending. Put a slash through the P if the praise was not contingent on attending.

praise for OL	+ / - / NA		Intervention Component
P	+	-	Tell OL, "Watch (TL's name) and see what she does."
P	+	-	Provide correct amount of delay (0 or 3 sec) for saying "look"
P NA	+	-	When TL approaches object, point to object and say "look."
P	+	-	Provide correct amount of delay (0 or 3 sec) for TL to identify unsafe situation.
P NA	+	-	Provide prompt "Look, there's (object) on the (location) and someone might fall"
P NA	+	-	Provide prompt, "Say there's (object) on the (location) and someone might fall."
P	+	-	Praise TL's correct response.
P	+	-	Provide correct amount of delay (0 or 3 sec) for TL to start moving object(s) and putting it away.
P NA	+	-	Provide prompt "You need to move it."
P NA	+	-	Provide physical prompts to help TL move object and put it away.
P	+	-	² While TL is moving object, tell OL "Look what TL is doing."
	+c	-c	
P	+	-	Praise TL's correct response.
P	+	-	Provide correct amount of delay (0 or 3 sec) for TL to tell mom/dad/teacher what she did.
P NA	+	-	Provide verbal prompt, "Go tell mom/dad/teacher what you did."
P NA	+	-	Provide verbal prompt, "Say, I put the (object) away."
P	+	-	While TL is telling adult, tell OL "Look what TL is doing."
	+c	-c	
P	+	-	Ask OL, "What did TL just do?"
	+	-	Provide neutral response to OL's answer ("Thanks for telling me")

Total number of components scored correctly/Total number of components scored: _____
 Percentage of components implemented correctly: _____

¹ Praise needs to be behavior specific
² Use the following code to score attentional cues:

+c OL not attending and adult gives cue

+ OL attending and adult did not give cue

-c OL attending and adult gives cue

- OL not attending and adult did not give cue

Appendix F

Intervention

INTERVENTION

(Attentional cue for OL) Tell OL, "Watch (TL's name) and see what she does."

(Delay) Provide correct amount of delay (0 or 3 sec) for providing attentional cue for TL ("look").

(Attentional cue for TL) If TL does not look at object, point to object and say, "Look"

Child Response: needs to identify object, location and risk for safety (i.e., "there's blocks on the stairs, someone might fall")

(Delay) Provide correct amount of delay (0 or 3 sec) for TL identifying unsafe situation.

Correct before the prompt	Incorrect before prompt
Praise TL for identifying unsafe situation.	Wait for end of delay and then provide prompt

Prompt: "Look, there's _____ on/in the _____, someone might fall."

Correct after prompt	Incorrect after prompt or No response
Praise TL for identifying unsafe situation	Provide verbal model: say, "there's blocks on the stairs and someone might fall"
	Praise correct response

(Delay) Provide correct amount of delay (0 or 3 sec) for TL moving object(s) and putting it away.

Child Response: needs to move object and put it away.

Correct before the prompt	Incorrect before prompt
Praise TL for moving object and putting it away	Wait for end of delay and then provide prompt

Prompt: "You need to move it"

Correct after prompt	Incorrect after prompt or No response
Praise TL for moving object and putting it away	Provide physical prompts to help child move object and put it away
	Praise correct response

(Attentional cue for OL if needed) While TL is moving object, tell OL, "Look what TL is doing." If OL is already watching, do not provide attentional cue.

(Delay) Provide correct amount of delay (0 or 3 sec) for TL for telling someone what she did.

Child Response: Tells mom/dad/teacher what she did.

Correct before the prompt	Incorrect before prompt
Praise TL for telling someone what she did.	Wait for end of delay and then provide prompt

Prompt "Go tell mom/dad/teacher what you did"

Correct after prompt	Incorrect after prompt or No response
Praise TL for telling someone what she did.	Provide verbal model: say, "I put the blocks away"
	Praise correct response

(Attentional cue for OL if needed) While TL is telling someone what she did, tell OL, "Look what TL is doing."

Ask OL, "What did TL just do?"

Provide neutral response to OL's answer ("Thanks for telling me")

Praise OL for attending 1-3 times throughout teaching

Appendix G
Accident/Injury Log

Accident/Injury Log

Person completing form: _____

Child(ren): _____

Setting (circle one): home school

Please record the following information related to any accident or injury that occurred in your home or classroom. Only record the information for incidents that you observe or someone reports to you. If a child has a bruise or mark and you do not know what caused it, do not report it. If no accidents or injuries occur, write none under other information.

Date	Place	Description / Cause	Extent/Severity of injury (if applicable)	Other information
<i>Examples: 1/16/98</i>	<i>Kitchen</i>	<i>Standing on chair to wash hands and fell off chair</i>	<i>Bumped head, no visible marks</i>	
<i>1/23/98</i>	<i>Out on playground</i>	<i>Tripped over ball on playground</i>	<i>Scrapped knee</i>	<i>Put Band-Aid on it</i>

Child's Name: _____ Person completing Form: _____

Please write down what the child tells you about or does to alter an unsafe situation.

Examples include if he/she (a) tells an adult something is not safe or that someone might get hurt, (b) moves objects or materials that if not moved might cause someone to get hurt, or (c) talks about things not being safe.

Date	Description of what child said or did

Appendix H
Teacher and Parent Letter and Questionnaires

May 19, 1998

Dear Parents and Teachers,

Thank you for participating in our study that looked at teaching preschool aged children preventive safety skills. We appreciated your willingness to open your home and classroom to us. Enclosed is a short questionnaire. Please complete it and return in the addressed envelope provided. Responses will be kept confidential and it is not necessary to put your name on the questionnaire. Each parent and teacher will be paid an honorarium of \$30. In order to receive this honorarium, please fill out the information at the bottom of this letter and return with the questionnaire. Please contact us if you have any questions. Thanks again for all of your help and support.

Sincerely,

Marion Tso
797-2017

Sarah Rule
797-1987

Name: _____

Address: _____

Social Security Number: _____

The person listed above will receive an honorarium of \$30 for participating in a study designed to teach preschool aged children with disabilities preventive safety skills.

(Parent)

How important is it for your preschool aged child to be able to do the following:

1. Move objects or materials left where people are likely to trip on them (e.g., ball on stairs, backpack left in doorway, etc.)?

Not Important				Very Important
1	2	3	4	5

2. Tell an adult if they move objects or materials so people will not trip on them?

Not Important				Very Important
1	2	3	4	5

3. How important is it for a child to tell you if there are objects or materials in pathways (e.g., ball on stairs, backpack left in doorway, etc.) before he/she moves them or puts them away?

Not Important				Very Important
1	2	3	4	5

4. If somebody showed you how to teach your child to identify and correct unsafe situations (objects lying around where people walk), would you want to teach your child to do this at home?

Not at all				Yes, Definitely
1	2	3	4	5

How did you feel about your child participating in this study? (use other side if needed).

(Teacher)

How important is it for a preschool aged child to be able to do the following:

1. Move objects or materials left where people are likely to trip on them (e.g., ball on stairs, backpack left in doorway, etc.)?

Not Important				Very Important
1	2	3	4	5

2. Tell an adult if they move objects or materials so people will not trip on them?

Not Important				Very Important
1	2	3	4	5

3. How important is it for a child to tell you if there are objects or materials in pathways (e.g., ball on stairs, backpack left in doorway, etc.) before he/she moves them or puts them away?

Not Important				Very Important
1	2	3	4	5

4. The procedure used could be easily implemented within the daily routines of my classroom..

Not at all				Yes, Definitely
1	2	3	4	5

5. I would use the procedures to teach safety related skills to the children in my class.

Not at all				Yes, Definitely
1	2	3	4	5

6. I would use the procedures to teach other skills.

Not at all				Yes, Definitely
1	2	3	4	5

7. How did you feel about having this study conducted in your classroom? (use other side if needed)?

Appendix I

Percent of Sessions Scored and Interobserver Agreement for
Responding to Unsafe Situations

**Percent of Sessions Scored and Interobserver Agreement for
Responding to Unsafe Situations**

Child	Baseline	Classroom Probes	Teaching	Cue for Observational Learner	All Conditions
Target Learner A					
Sessions Scored for Rel.	25%	20%	25%	NA	
Mean	100	100	87		89
Range	100	100	67-100		67-100
Observational Learner A					
Sessions Scored for Rel.	17%	33%	NA	NA	
Mean	100	100			100
Range	100	100			100
Target Learner B					
Sessions Scored for Rel.	27%	38%	32%		
Mean	100	91	92		91
Range	100	80-100	67-100		67-100
Observational Learner B					
Sessions Scored for Rel.	29%	33%	NA	35%	
Mean	93	100		94	94
Range	86-100	100		83-100	83-100
Target Learner C					
Sessions Scored for Rel.	43%	50%	30%	NA	
Mean	97	100	92		94
Range	83-100	100	80-100		80-100
Observational Learner C					
Sessions Scored for Rel.	31%	36%	NA	50%	
Mean	100	100		92	97
Range	100	100		83-100	83-100
Target Learner D					
Sessions Scored for Rel.	16%	100%	30%	NA	
Mean	95	100	82		87
Range	86-100	100	61-100		61-100
Observational Learner D					
Sessions Scored for Rel.	10%	33%	NA	29%	
Mean	100	100		100	100
Range	100	100		100	100
Target Learner E					
Sessions Scored for Rel.	32%				
Mean	98				98
Range	83-100				83-100

Child	Baseline	Classroom Probes	Teaching	Cue for Observational Learner	All Conditions
Observational Learner E	-				
Sessions Scored for Rel.	36%				
Mean	97				97
Range	83-100				93-100
Target Learner F					
Sessions Scored for Rel.	20%				
Mean	100				100
Range	100				100
Observational Learner F					
Sessions Scored for Rel.	17%				
Mean IOA	100				100
Range IOA	100				100
TOTALS	29%	36%	28%	36%	

Appendix J
Teacher Comments

Teacher's comments in response to the question, "How did you feel about having this study conducted in your classroom?"

"I wish I could see the skill transfer to more natural situations, instead of set up situations."

"I feel that the study was useful because of the awareness level. I don't believe that the children in the study improved a lot, but the skill is very important for them to learn."

"I was curious to see the results of this study- to see how each student reacted to un-safe classroom situations."

"I think teaching children to pick up objects from the floor, so people aren't injured, is important; however, I believe this was difficult to do in a classroom setting where toys and 'things' are everywhere. How do they determine what to pick up and what is set out or okay to be there? I don't feel the 2 students involved in the program will continue picking things up and reporting, nor will they generalize it to other people/settings. I do think it gave them both an 'awareness' of the concept and a background for this type of learning in the future."

Note: I appreciate what you did in our classroom and how well you interacted with staff and students. Thanks!"

Parent's comments in response to the question, "How did you feel about your child participating in this study?"

"I thought it was fine."

"I felt like it was an important issue to begin with and a good idea to reinforce at school, but most of the responsibility should be on the parent. As far as my child, I did not know if any teaching was done at school or not, but I did not see dramatic results."

"Very good, because it's more security for my child and teaching him to recognize dangers will reduce accidents."

"My daughter needs maybe another year to gain this understanding."

"I thought that it was a good thing to try and teach children. I would rather see time spent on teaching children about dangers such as, ovens, stoves, knives, scissors, crossing streets, medicines, cleaning fluids, etc."

"My child' has learned a few things that at home I had difficulty getting across (things like carrying scissors.) If nothing else, he seems not to trip on things in his way anymore."

"I think my son was usually too excited to have a new person around and wanted to show off, so it was hard for him to concentrate on what he should be doing, but I think he did rather well and we both enjoyed this opportunity."

"I felt this study made my daughter more aware of safety skills in the house. I thought it was a useful and helpful experience."